

**DEFENSE TECHNICAL INFORMATION CENTER**

**DEFENSE VIRTUAL LIBRARY**

**TECHNICAL METADATA FOR THE LONG-TERM  
MANAGEMENT OF DIGITAL MATERIALS:**

**PRELIMINARY GUIDELINES**

**21 March 2002  
Silver Image Management  
Contract No. SP4700-01-P-0152**

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## **Project Summary Report**

### Executive Summary

Long-term preservation of digital information is one of the most critical challenges facing the information community. No single technology will meet that challenge. However, there is agreement that whatever technology, or technologies, may be adopted, success will depend on the availability of adequate metadata describing the technical characteristics of the digital materials being preserved. This report, prepared by Silver Image Management (SIM), proposes technical metadata elements appropriate for digital objects in the Defense Virtual Library (DVL). DVL is a collaborative effort of the Defense Technical Information Center, the Defense Advanced Research Projects Agency (DARPA) and the Corporation for National Research Initiatives (CNRI).

The Open Archival Information System (OAIS) framework was adopted to provide a conceptual structure for the metadata. Next, the International Organization for Standardization (ISO) International Electrotechnical Commission (IEC) Standard 11179 was used for naming the data elements and describing them with appropriate attributes. The expectation is that an XML DTD will be prepared based on these elements and their attributes. Finally, the guidelines reflect extensive review of the practices of a wide range North American, UK, European and Australian projects similarly concerned with developing technical metadata for preservation.

Documentation prepared for this project consists of a summary report of the project, the guidelines themselves and supporting documentation, including diagrams showing the relationships among the data elements and a table listing the data elements according to the OAIS framework.

## Background

The Defense Virtual Library (DVL) was initiated by DTIC in cooperation with the Defense Advanced Research Projects Agency (DARPA) and the Corporation for National Research Initiatives (CNRI). DTIC contracted with Silver Image Management (SIM) to develop procedures and standard practices for describing technical metadata in a digital library application.<sup>1</sup> Dr. Marcia Hanna was DVL program manager at DTIC throughout the period of this contract.

DTIC is the central Department of Defense facility for providing access to and facilitating the exchange of scientific and technical information. DVL objectives are to examine new methods for managing digital information and to identify the metadata required for such long-term management. DVL is the Defense testbed for the Digital Object Architecture developed by CNRI. Uniform Resource Identifiers that use Handle System technology are a fundamental part of that architecture. DVL utilizes standard Internet browsers and advanced commercial search engines. Initially, DVL used the InQuery search engine but replaced it with Verity search technology.

Beginning in 1997, DTIC placed several contracts with SIM to create cataloging guidelines for digital materials in four format categories: still images, recorded sound, moving images and complex digital objects. The DVL currently includes digital files in five broad format categories. There are 1) photographic images from the Trinity project at Los Alamos; 2) audio files with music or documentary sound; 3) video from the DTIC Technical Reports (TR) collection and from Carnegie Mellon University's Informedia Digital Video Library; 4) complex digital objects from DTIC CDs and from the Web; and 5) full-text documents from DTIC's TR collection. SIM did not provide consultation for the TR documents since DTIC cataloging was already available for them. This report does not review the information provided in SIM guidelines or reports prepared for any of these previous components.<sup>2</sup> However, the earlier guidelines are available at the DVL web site and from DTIC's production systems.

## Scope of work

In developing digital library applications, a primary concern is how to manage digital materials over time. Although research is continuing on long-term preservation, maintenance issues for digital materials are a major concern. One aspect of ensuring the long-term preservation of digital materials is creating the necessary metadata to communicate information about the materials and their requirements. Identifying the required metadata and defining its parameters will aid in future development of the tools for capture, rendering, management or maintenance. Technical metadata is the specialized metadata that identifies structural, administrative, and preservation details

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<sup>1</sup> Contract SP4700-01-P-0152 was awarded on 14 September 2001.

<sup>2</sup> See Defense Technical Information Center contract numbers SP4700-97-M-0348, SP4700-98-M-0450, SP4700-99-M-0592 (with modification DTICZ00179001-A), and SP4700-00-M-0381. Additionally, contract number SP4700-99-M-0502 was awarded in 1999 to furnish Minaret cataloging support.

related to digital files.<sup>3</sup> The DVL is an endeavor to be at the forefront of digital library applications identifying and defining required technical metadata and implementing its use.

The scope of work for the current contract builds upon SIM's previous DVL project work. During the previous contract, SIM began research on technical metadata and prepared two draft documents. The first was a preliminary effort to identify and define technical metadata requirements working within the framework defined by Consultative Committee for Space Data Systems (CCSDS) Open Archival Information System (OAIS). SIM prepared an accompanying table listing *DVL Data Elements Implementing OAIS Preservation Description Information*. That table grouped each element according to Preservation Description Information classes identified in the OAIS Reference Model.<sup>4</sup>

The work done during the current contract updates and expands on this preliminary work, detailing attributes of technical metadata elements following the six-part International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) Standard 11179. This standard facilitates creation of sharable metadata registry content. SIM worked within ISO/IEC 11179 to make recommendations on field syntax, maximum occurrence, obligation, relationships and permissible values for DVL technical metadata.

The selection and description of proposed DVL technical metadata elements is informed by extensive review of related work in the United States, the United Kingdom, Europe and Australia. That work includes but is not limited to:

- Curl (Consortium of University Research Libraries, Cambridge, Oxford and Leeds) Exemplars in Digital Archives (CEDARS);
- Networked European Deposit Library (NEDLIB);
- National Library of Australia (NLA);
- International Research on Permanent Authentic Records in Electronic Systems (InterPARES);
- Metadata Encoding and Transmission Standard (METS);
- Dublin Core (DC);
- Moving Picture Experts Group *Multimedia Content Description Interface* (MPEG7);
- Online Computer Library Center/Research Libraries Group (OCLC/RLG) Preservation Metadata Working Group;

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<sup>3</sup> The term 'technical metadata' is used throughout this report to refer to administrative, structural, and preservation metadata related to digital objects. According to *The Making of America II Testbed Project: A Digital Library Service Model* (Washington, DC : Digital Library Federation, Council on Library and Information Resources, December 1999, CLIR pub. 87, <http://www.clir.org/pubs/abstract/pub87abst.html>) structural metadata is metadata "relevant to the presentation of a digital object to the user" (p. 21) while administrative metadata is metadata that "allows the repository to manage its digital collection" (p. 23). This report does not distinguish between types of technical metadata related to the digital object.

<sup>4</sup> The table followed the pattern established in *Preservation Metadata for Digital Objects: A Review of the State of the Art*, A White Paper by the OCLC/RLG Working Group on Preservation Metadata, January 31, 2001, [http://www.oclc.org/digitalpreservation/presmeta\\_wp.pdf](http://www.oclc.org/digitalpreservation/presmeta_wp.pdf).

- World Wide Web Consortium (W3) Extensible Markup Language XML Schema; and
- IMS Global Learning Consortium projects for Learning Object Metadata (LOM).

Resource sharing among these projects contributes to the creation of a virtual library application that is both extensible and interoperable over the long-term.

Beyond the identified scope of work, SIM assisted DVL project officer Carrie Schwarten in her requests for information about initiating digitization projects in preparation for future DVL endeavors.

## OAIS

DVL adopted the OAIS Reference Model as its framework for technical metadata for digital preservation. The Reference Model defines an OAIS as “an archive, consisting of an organization of people and systems, that has accepted the responsibility to preserve information and make it available for a Designated Community.”<sup>5</sup> The OAIS model provides a theoretical framework for an archival system, and integrates its conceptual approach with a hierarchical structure for organizing information, particularly as it relates to digital material. The model does not specify an implementation strategy; instead it provides guidelines to address digital archiving concepts.

The OAIS model describes an Archival Information Package (AIP) as an aggregation of four types of Information Objects: content information object, preservation description information object, packaging information object and descriptive information object. Content information includes the data object as well as representation information (structural and semantic information about the object). Preservation Description Information (PDI) is comprised of reference information, provenance information, context information and fixity information.<sup>6</sup> In a publication reviewing recent digital preservation metadata developments, Michael Day, Metadata Research Officer at the United Kingdom Office for Library and Information Networking (UKOLN), noted that library projects tended “...to focus discussion on the terminology defined by the OAIS model” and identified this response as one of the most important consequences of the model.<sup>7</sup>

A White Paper prepared by the OCLC/RLG Preservation Metadata Working Group suggests, “The OAIS model may be a useful starting point for developing a preservation

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<sup>5</sup> Reference Model for an Open Archival Information System (OAIS), Consultative Committee for Space Data Systems. CCSDS 650.0-R-1, May 1999, p. 1-11, <http://www.ccsds.org/documents/pdf/CCSDS-650.0-R-1.pdf> and <http://www.ccsds.org/documents/pdf/CCSDS-650.0-R-2.pdf>.

<sup>6</sup> The AIP elements and the four formats (image, audio, video, digital object) are not described in the DVL technical metadata documentation, but some summary information is available in the appendix.

<sup>7</sup> “Metadata for Digital Preservation: A Review of Recent Developments,” by Michael Day, 2001 September 25, from paper delivered 5 September 2001, <http://www.ukoln.ac.uk/metadata/presentations/ecdl2001-day/paper.html>

metadata framework of general applicability.”<sup>8</sup> It outlines several points of convergence among state-of-the-art digital library applications (primarily CEDARS, NLA and NEDLIB) investigating long-term preservation issues. Areas of commonality include knowledge or adoption of the OAIS Reference Model, agreement about the need for technical metadata to facilitate management and access to archival objects, and the need for technical metadata to be independent of the object itself to support interoperability and preservation. The DVL project at DTIC shares the concerns expressed in this White Paper and has common goals with these state-of-the-art projects.

### ISO/IEC 11179 and Metadata Registries

ISO/IEC 11179 specifies basic aspects of data element composition for inclusion in metadata registries. The standard applies to the formulation of data element representations and meaning as shared among people and machines. DVL initiated the use of the ISO/IEC 11179 standard in order to facilitate participation in metadata registry efforts. Metadata registries are authoritative semantic maps with associated procedures for storing and registering detailed metadata from multiple sources and diverse organizations in a common structured form. Extensions to the formats are recorded, as are agreed-upon mappings between diverse formats. Use of the ISO /IEC standard and participation in metadata registries promotes access, understanding, and sharing of data across time and space, all of which are goals of the DVL project.

Further, use of this structure makes it easier to check the metadata for consistent application. This standardized structure for registering metadata elements was used by CNRI in creating a metadata schema for the publication, *D-Lib*, an electronic journal focused on research in digital libraries, and for its participation in the D-Lib Test Suite, a consortium of five universities and *D-Lib*. The Royal Canadian Mounted Police (RCMP), Integrated Police Information Reporting System (IPIRS) Data Standards Secretariat is another example of an organization working to implement use of the 11179 standard.<sup>9</sup> The RCMP IPIRS project has created documentation to aid in the preparation of data taxonomies for data standards and data naming conventions for data dictionaries.

Despite the obvious advantages of working within the framework of ISO/IEC 11179, it was not easy to identify which version to use. The would-be user can locate different versions of each part of the six-part ISO/IEC 11179 standard. Official versions are available but working drafts are also available on the Web. In the early phase of the project, SIM implemented use of a different (and earlier) version of the document than CNRI anticipated. Once all involved realized that several versions were in use,

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<sup>8</sup> White Paper by the OCLC/RLG Working Group on Preservation Metadata, *Preservation Metadata for Digital Objects: A Review of the State of the Art*, p. 10, [http://www.oclc.org/digitalpreservation/presmeta\\_wp.pdf](http://www.oclc.org/digitalpreservation/presmeta_wp.pdf).

<sup>9</sup> Royal Canadian Mounted Police (RCMP), Integrated Police Information Reporting System (IPIRS) Data Standards Secretariat documentation: *Data Classification*, version 1.0, 2000 February 14, [http://www.rcmp-grc.gc.ca/ipirs/documents/cpsin\\_data\\_classification\\_v1e.pdf](http://www.rcmp-grc.gc.ca/ipirs/documents/cpsin_data_classification_v1e.pdf) and *Data Naming Convention*, 2000 February 10, [http://www.rcmp-grc.gc.ca/ipirs/documents/cpsin\\_data\\_naming\\_convention\\_v1e.pdf](http://www.rcmp-grc.gc.ca/ipirs/documents/cpsin_data_naming_convention_v1e.pdf).

Christophe Blanchi at CNRI recommended the use of specific versions, namely ISO/IEC 11179, Part 3, “Basic Attributes of Data Elements” (1998) and Part 5, “Naming and Identification Principles” (2001). His recommendation was adopted. The 1998 version of Part 3 is not the most current version, but appears to be less confusing than the 2000 version. The 2001 version of Part 5 is very similar to the 1995 version, but clearer in defining naming principles.

### Other Projects

The DVL document *Technical Metadata for the Long-Term Management of Digital Materials: Preliminary Guidelines* does not contain the detailed data elements included in other current work like the National Information Standards Organization (NISO) Draft Standard *Data Dictionary: Technical Metadata for Digital Still Images*, the METS schema, the W3 XML schema, or the Preservation Metadata Working Group’s Content Information Recommendations. The DVL *Preliminary Guidelines* attempts to identify the most prominent elements required to begin long-term work. A more specific level of detail will be required later. In the meantime, there is the hope that a compelling standard will eventually emerge that will simplify future digital preservation project work.

In researching results from other projects, it was both educational and perplexing to learn that there were so many different ways to order and classify schema. Here are a few examples. The National Library of the Netherlands *Long Term Preservation Study* distinguishes between Intellectual Preservation, Media Preservation and Technology Preservation. The Making of America project distinguishes between descriptive, administrative and structural metadata. METS classifies administrative metadata into four types: technical metadata, intellectual property rights metadata, source metadata and digital provenance metadata. In “How to Preserve Authentic Electronic Records” InterPARES distinguishes between conservation actions and maintenance activities as part of preservation. Finally, the IMS Learning Object Metadata draft standard includes these categories: general; lifecycle; meta-metadata; technical; educational; rights; relation; annotation; classification. There are many possible levels of granularity and such different ways to categorize information. Working within the OAIS framework and ISO/IEC 11179 is sound strategy because it makes possible improved communication among divergent digital applications.

### Future implementation

The documentation prepared by SIM will be used in the creation of an Extensible Markup Language (XML) Document Type Definition (DTD) for the long-term management of technical metadata. The DVL, CNRI and SIM teams are in agreement that XML is the appropriate technology for this purpose for several reasons. XML is both human readable and relatively machine friendly because it is a text-based file format. Many vendors have become supportive of XML technology since adding XML support to existing applications is not particularly difficult. XML makes data portable instead of relegating it to a proprietary format from which it may not be readily migrated. XML supports the Unicode standard for characters and is useable for a wide variety of languages and enjoys

international acceptance. XML provides structure for data and acknowledges the importance of establishing parent/child relationships. XML files tend to be relatively small and easy to compress and store in archives.

Once the DVL DTD is created, it can be tested and implemented by cataloging specialists. The resulting cataloging work can then be validated against the DTD to be certain that it conforms to the standards the DTD provides. This cyclical process will ensure that consistency of standards is used throughout the DVL application.

After the process is underway, it will be possible to identify new issues in developing digital libraries over the long-term based on actual digital library implementations. Day speculated on the OAIS framework, stating "...more time and effort has been expended on developing conceptual metadata specifications than in testing them in meaningful applications."<sup>10</sup> The next step for the DVL is to work through the technical metadata specifications using actual examples in order to raise issues about the model *per se* as well as its implementation.

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<sup>10</sup> Day, "Metadata for digital preservation: a review of recent developments," <http://www.ukoln.ac.uk/metadata/presentations/ecdl2001-day/paper.html>.



## **Technical Metadata for the Long-Term Management of Digital Materials: Preliminary Guidelines**

These preliminary guidelines work within the OAIS framework to identify data elements and group them according to information classes following conventions established in ISO/IEC11179. Table 1, which appears on the next page, outlines the attributes used for DVL technical metadata elements. Attributes express the characteristics of an object or entity described in the data element. Tables are used in the remainder of the document to represent individual data elements and sub-elements and identify their characteristics.

The data elements are organized according to the OAIS reference model, which divides information into five categories. The first four categories are types of Preservation Description Information. They include reference information, context information, provenance information and fixity information. The fifth category is representation information. For DVL purposes, this category is further subdivided according to format (i.e., image, audio, video, and complex digital object) in order to distinguish the specific representation information that is appropriate to each.

The preliminary guidelines can be used in tandem with the supporting documentation in the appendices. Appendix A contains diagrams that illustrate the relationships between the DVL data elements. Appendix B lists each of the elements in order by identification number and name. It includes definitions of the five broad OAIS data types used to classify the data elements that do not have their own corresponding tables within the guidelines. Appendix C defines basic OAIS terminology for information classes and packages.

Appendix D contains a list of the sources consulted in creating this document, including bibliographic references. This appendix also serves as the key to the acronyms used throughout the guidelines for related project names. In order to conserve space and maximize the visual presentation of this information, acronyms are frequently used in the tables. It is important to consult this appendix in order to understand related work done in other projects.

**Table 1. Characteristics of Attributes Used for DVL Technical Metadata Elements**

<b>Element name</b>	Name of elements and sub-elements. Element names are composed of the hierarchical string (each term separated with a underscore) in order to keep track of their relationship within the grouping. Some sub-element names used are polymorphs because there are sub-elements with the same meaning within several different element categories (examples include Version, Link, and several sub-elements of Representation Format).
<b>Identifier</b>	Identification number for the element and sub-element name. Corresponds to the identifiers used in the documentation in the appendices. In cases where a sub sub-element links to multiple sub-elements, 'x' is used instead of an integer (e.g., 1.1.x.1).
<b>Version/version date</b>	Identifies issue of version and date of registration. This version is 0.1.
<b>Registration authority</b>	Organization authorized to register data elements (i.e., Defense Technical Information Center).
<b>Synonymous name</b>	Represents the data element concept with synonymous expressions. Provides another name that is familiar in specific environments.
<b>Context</b>	States where the synonymous name originates if there is a specific application. Blank unless a Synonymous name is present.
<b>Definition</b>	Describes the essence of the element, including definitions provided by reference sources.
<b>Classification scheme</b>	Relates elements to other schemes or models.
<b>Keywords</b>	Search key words to use to retrieve the element.
<b>Related data reference</b>	Used in conjunction with Type of Relationship to explain qualification or hierarchy.
<b>Type of relationship</b>	Includes equivalents, derivatives, listing of sequences within a subset. Terms include: qualifier_of; qualified_by; subject_of; part_of; parent_of; child_of; attribute_of; has_attribute; and derived_from.
<b>Category</b>	Type of designation used to represent an element (bar code, character string).
<b>Form of representation</b>	Description of the form in which the data element is represented (including text; code; date; uri; time; measure; number; amount). <sup>11</sup>
<b>Datatype</b>	Form of representation depicting element's values (character; ordinal number; integer; decimal; real; scaled;

<sup>11</sup> Representation Term List taken from *Using Levels of Abstraction to Name Data Elements* by Judith J. Newton (National Institute of Standards & Technology), The Data Administration Newsletter, <http://www.tdan.com/i007ht01.htm>. The term 'uri' replaces 'url' as found in ISO11179-3.3 dtd in English.doc supplied by Christophe Blanchi, Corporation for National Research Initiatives.

	<p>bit; rational; date).</p> <p>ISO 11404:  <a href="http://std.dkuug.dk/JTC1/SC22/WG11/docs/iso11404.pdf">http://std.dkuug.dk/JTC1/SC22/WG11/docs/iso11404.pdf</a></p> <p>METS uses W3 XML schema datatypes, including string, Boolean, decimal, dateTime, and others (see <a href="http://www.w3.org/TR/xmlschema-2/#datatype">http://www.w3.org/TR/xmlschema-2/#datatype</a>)</p>
<b>Maximum size</b>	<p>Maximum number of units representing the element. ADN includes number of allowable characters per element; their specifications are incorporated here for several elements. Phrasing for attribute is “Unlimited” or “Not to exceed ___ digits/characters” or a single integer (i.e. 3).</p>
<b>Minimum size</b>	<p>Minimum number of units representing the element. This attribute has been defaulted to zero (0) for each data element.</p>
<b>Layout of representation</b>	<p>Description of layout of characters in the element, used especially when a specific structure is necessary.</p>
<b>Example/Code</b>	<p>Actual text examples or codes followed by parenthetical explanations of the code as needed.</p>
<b>Permissible values</b>	<p>Set of permissible values (names, codes, and text) pertaining to the data element. Can include pick lists, controlled word lists or more formal schema. ADN uses vocabulary levels (restricted or expandable).</p>
<b>Responsible organization</b>	<p>Organization responsible for the attributes (Defense Technical Information Center).</p>
<b>Status</b>	<p>Registration life-cycle position (Final).</p>
<b>Submitting organization</b>	<p>Organization submitting the element (Defense Technical Information Center).</p>
<b>Comment</b>	<p>Details and notes about the element. For example, some elements include the notation: “Work from an expandable list of values for this element” which means that a controlled list should be maintained and expanded upon as necessary during production.</p>
<b>MARC/DC crosswalk</b>	<p>Indicates comparable MARC or Dublin Core field, if any apply. Some elements with corresponding MARC fields do not distinguish subelements at the subfield level.</p>
<b>Source</b>	<p>CDL uses “Source” to specify whether the source of data is automatically generated or supplied manually. All entries to this table that follow CDL attribution begin with ‘CDL.’ If entry states only “automatically generated from defaults,” the assumption is that this data could be defaulted into a system. For example, many of the subelements of Provenance_Action contain technical metadata that would be recorded in batches as digitization occurred and then defaulted into the system.</p>
<b>Applicable to all formats</b>	<p>Indicates conditional use of element based on format</p>

	(image, audio, video, digital object, etc.). If not “All,” indicates which formats are valid or invalid (“Only ____” or “All but ____”).
<b>Obligation</b>	Indicates input requirement. Terms include: mandatory, optional, desirable or conditional (i.e. mandatory if applicable).
<b>Maximum occurrence</b>	Indicates repeatability of element as well as repeatability patterns. If repeatable, indicates whether the attribute is repeatable or if multiple values should be entered within a single attribute (single, multi-valued attribute). Terms: Repeatable; Repeatable only as attribute; Repeatable only with multiple values; and Not repeatable.

## 1.0 Reference Information

### 1.1 Reference Identifier

<b>Element name</b>	Reference_Identifier_Uniform_Resource
<b>Identifier</b>	1.1.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	NLA: "An identifier or 'permanent name' for an object that identifies it uniquely and persistently, and enables links to different manifestations of it, to metadata about it, and to other objects related to it." EUL: Persistent identifier defined as "an identifier for an object that enables links to different manifestations of it, to metadata about it, and to other objects related to it."
<b>Classification scheme</b>	
<b>Keywords</b>	Handle; Persistent identifier; Digital object identifier; Uniform Resource Locator; Uniform Resource Identifier
<b>Related data reference</b>	Reference_Identifier_Version
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed 1024 digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	To date, all DVL handles begin with the prefix hdl:100.1. This is followed with a forward slash and the alphanumeric code representing the digital object.
<b>Example/Code</b>	hdl:100.1/PH24 hdl:100.1/MIADM000385
<b>Permissible values</b>	Follow DTIC/MG
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Unique alphanumeric identifier designed by DTIC for DVL purposes.
<b>MARC/DC crosswalk</b>	856u / <DC>Identifier
<b>Source</b>	CDL automatically generated.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Mandatory
<b>Maximum occurrence</b>	Not repeatable

<b>Element name</b>	Reference_Identifier_Unique
<b>Identifier</b>	1.1.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Unique alphanumeric identifier representing the digital object.
<b>Classification scheme</b>	
<b>Keywords</b>	Identifier
<b>Related data reference</b>	Reference_Identifier_Version
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed     digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	The identifier is composed of alphanumeric code.
<b>Example/Code</b>	CXADM001018
<b>Permissible values</b>	Follow DTIC/MG
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Number designed by DTIC for DVL purposes. The URI may serve as the unique identifier. The identifier may be used to represent sub-elements of the object.
<b>MARC/DC crosswalk</b>	035 / <DC>Identifier
<b>Source</b>	CDL automatically generated.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Mandatory
<b>Maximum occurrence</b>	Not repeatable

<b>Element name</b>	Reference Identifier Electronic File
<b>Identifier</b>	1.1.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Identifies the name of digital file. It can include a file extension. This identifier can represent elements and sub-elements.
<b>Classification scheme</b>	
<b>Keywords</b>	File name; Electronic file
<b>Related data reference</b>	Reference Identifier Version
<b>Type of relationship</b>	qualified by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed    digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	The identifier is composed of alphanumeric code.
<b>Example/Code</b>	SD33.wav MIADM000285_1_clip_1
<b>Permissible values</b>	Follow DTIC/MG
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Identifier designed by DTIC for DVL purposes.
<b>MARC/DC crosswalk</b>	856f / <DC>Identifier
<b>Source</b>	CDL automatically generated.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Reference Identifier Label
<b>Identifier</b>	1.1.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Title/creator field linkage to display to end user for identification purposes.
<b>Classification scheme</b>	
<b>Keywords</b>	Label; Title; Creator
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	A Stitch in time [videorecording]
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	1xx and 245 / <DC>Creator and <DC>Title
<b>Source</b>	CDL manually supplied in encoding.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable



<b>Element name</b>	Reference_Identifier_Version
<b>Identifier</b>	1.1.x.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Names, codes, numbers, or text that distinguish one version of a digital file from others.
<b>Classification scheme</b>	
<b>Keywords</b>	Version
<b>Related data reference</b>	Reference_Identifier_Uniform_Resource Reference_Identifier_Unique Reference_Identifier_Electronic_File
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	alpha 3.0 1.2
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	562c / <DC>Identifier
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

## 1.2 Reference Domain

<b>Element name</b>	Reference_Domain_Electronic_Address
<b>Identifier</b>	1.2.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Domain or host name (network address) for the electronic location
<b>Classification scheme</b>	
<b>Keywords</b>	Electronic address; Domain address; Web address
<b>Related data reference</b>	Reference_Domain_Name
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	URI
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed     digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	dvl.dtic.mil
<b>Permissible values</b>	Follow DTIC/MG
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	856a / <DC>Identifier
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Mandatory
<b>Maximum occurrence</b>	Not repeatable

<b>Element name</b>	Reference_Domain_Name
<b>Identifier</b>	1.2.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Conventional name and location of the host.
<b>Classification scheme</b>	
<b>Keywords</b>	Domain name; Corporate name
<b>Related data reference</b>	Reference_Domain_Electronic_Address
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Defense Technical Information Center, Fort Belvoir, VA
<b>Permissible values</b>	Follow DTIC/MG
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	856n / <DC>Rights
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Not repeatable

## 2.0 Context Information

<b>Element name</b>	Context_Relation_Manifestation
<b>Identifier</b>	2.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Identifies or describes related material, both digital and analog. Contains textual description of resource and identification number. NLA: Relationships and links between manifestation and other objects. ViDe: Uses Relation field to bring together different instantiations of the information object (analog original, analog preservation format, digital master, use copy).
<b>Classification scheme</b>	
<b>Keywords</b>	Related material; Relationship; Manifestation; Instantiation; File group
<b>Related data reference</b>	Context_Relation_Manifestation_Type Context_Relation_Link
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Accompanies: DTIC technical report, number, title, control number. This is the 5 <sup>th</sup> generation copy of [unique identifier and type]. Executive summary also available from the DoD web site. Master Thumbnail Gottscho-Schleisner Collection (Library of Congress) (DLC) 85861312 Carnegie-Mellon Collection
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	530 (Additional physical form) and 787 (nonspecific relationship / <DC>Relation.
<b>Source</b>	

Refer to Sources Consulted (Appendix D) for acronym names and references.

<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Context_Relation_Manifestation_Type
<b>Identifier</b>	2.1.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>Qualifies type of relationship to resource, including relationship of a part to a whole. Used to relate subunit level of component part hierarchy to unit at collection level. Identifies collection title and identifier, sequence in a presentation or part or a whole (like a grid or detail). NAA: Relation element includes sub-elements Related Item ID, Relation Type (contains/contained in, next/previous, replaces/replaced by, refers to, derived from), and Relation Description. ADN: DLESE kept the old IsBasedOn and IsBasisFor and added HasThumbnail from NASA. GEM: Relation Element Controlled Vocabulary based on Dublin Core: <a href="http://www.geminfo.org/Workbench/Metadata/relationtable.html">http://www.geminfo.org/Workbench/Metadata/relationtable.html</a> VRA: Contains proposed Relation types for Dublin Core Relation element, including larger entity, copy or, version of references, derived from. Whole/part or associative.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Manifestation type; Relation type; Whole/Part; Association
<b>Related data reference</b>	Context_Relation_Manifestation
<b>Type of relationship</b>	qualifier of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Is Part Of References Is Format Of
<b>Permissible values</b>	<p>Could use Dublin Core controlled vocabulary of qualifiers as controlled terminology for this element. See: <a href="http://dublincore.org/documents/2000/07/11/dcmes-qualifiers/#relation">http://dublincore.org/documents/2000/07/11/dcmes-qualifiers/#relation</a></p>
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center

Refer to Sources Consulted (Appendix D) for acronym names and references.

<b>Comment</b>	Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	787 (Nonspecific relationship) and 773 (Host item entry) / <DC>Relation.
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable only as attribute.

<b>Element name</b>	Context_Relation_Bibliographic_Record
<b>Identifier</b>	2.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	Control number
<b>Context</b>	MARC
<b>Definition</b>	A unique system-generated number identifying the MARC bibliographic record linked with the digital object.
<b>Classification scheme</b>	
<b>Keywords</b>	Bibliographic record control number; MARC control number
<b>Related data reference</b>	Context_Relation_Link
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed     digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	Alphanumeric identifier.
<b>Example/Code</b>	DTIC-000001
<b>Permissible values</b>	Follow DTIC/MG
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	001 / <DC>Relation.Is Referenced By or References
<b>Source</b>	CDL manually supplied in data capture.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Mandatory
<b>Maximum occurrence</b>	Not repeatable



<b>Element name</b>	Context_Relation_Documentation
<b>Identifier</b>	2.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Details about documentation related to the material, including codebooks, manuals, and other documentation. PMWG: Documentation necessary or useful for display or interpretation.
<b>Classification scheme</b>	
<b>Keywords</b>	Documentation; Codebooks; Manuals
<b>Related data reference</b>	Context_Relation_Link
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Documentation in 'readme' file. Glossary available at <a href="http://www.info">http://www.info</a>
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	556 / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Context_Relation_Finding_Aid
<b>Identifier</b>	2.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Description of related finding aid, including title and notes as needed. NLA Access Facilitators includes finding aids.
<b>Classification scheme</b>	
<b>Keywords</b>	Finding aid
<b>Related data reference</b>	Context_Relation_Link
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed     digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Finding aid (electronic): available on the Internet at the DVL Web site. Finding aid (unpublished): Lists items in numerical order. Available in library Reading Room.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	555 / <DC>Relation.Is Referenced By or References
<b>Source</b>	CDL manually supplied in data capture.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Mandatory
<b>Maximum occurrence</b>	Not repeatable

<b>Element name</b>	Context_Relation_Link
<b>Identifier</b>	2.x.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Provides linkage between related digital objects, whether reference sources, other digital files representing the same content, or similar materials. NLA: Linkage to other manifestations including finding aids.
<b>Classification scheme</b>	
<b>Keywords</b>	Linkage; Finding aids; Reference sources
<b>Related data reference</b>	Context_Relation_Manifestation Context_Relation_Bibliographic_Record Context_Relation_Documentation Context_Relation_Finding_Aid
<b>Type of relationship</b>	qualifier of
<b>Category</b>	Character representation
<b>Form of representation</b>	URI
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Examples from Library of Congress: <a href="http://hdl.loc.gov/loc.mbrsmi/sawmp.1447">http://hdl.loc.gov/loc.mbrsmi/sawmp.1447</a> [motion picture with bib record] <a href="http://hdl.loc.gov/loc.music/eadmus.mu998001">http://hdl.loc.gov/loc.music/eadmus.mu998001</a> [EAD finding aid]
<b>Permissible values</b>	Uniform Resource Identifier.
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Can include introductory phrase to express date information was checked: Address as of [date]:
<b>MARC/DC crosswalk</b>	<DC>Relation.
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

### 3.0 Provenance Information

<b>Element name</b>	Provenance_Location
<b>Identifier</b>	3.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Name of the organization or agency holding the material or providing access to it. This organization or agency is the source of the material being described.
<b>Classification scheme</b>	
<b>Keywords</b>	Organizational name; Institutional name; Corporate name; Source; Location
<b>Related data reference</b>	Provenance_Location_Address Provenance_Location_Uniform_Resource_Identifier Provenance_Location_Source_Code
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Air Combat Command Heritage of America Band
<b>Permissible values</b>	When available, use form of name listed in DTIC Corporate Source Authority System at: <a href="http://www.dtic.mil/corpsource/">http://www.dtic.mil/corpsource/</a> .
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	852 / <DC>Rights
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Location Address
<b>Identifier</b>	3.1.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Address of the organization or agency holding the material or providing access to it. This organization or agency is the source of the material being described.
<b>Classification scheme</b>	
<b>Keywords</b>	Street address; Mailing address
<b>Related data reference</b>	Provenance Location
<b>Type of relationship</b>	qualifier of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	[Street name], [City], [State abbreviation] [Zip code]
<b>Example/Code</b>	86 Hickory Street, Langley Air Force Base, VA 23665-2192 USA
<b>Permissible values</b>	When available, use form of address listed in DTIC Corporate Source Authority System at: <a href="http://www.dtic.mil/corpsource/">http://www.dtic.mil/corpsource/</a> .
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	852 / <DC>Rights
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Location Uniform Resource Identifier
<b>Identifier</b>	3.1.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Uniform resource identifier to link to the organization or agency holding the material or providing access to it. This organization or agency is the source of the material being described.
<b>Classification scheme</b>	
<b>Keywords</b>	Uniform resource identifier
<b>Related data reference</b>	Provenance Location
<b>Type of relationship</b>	qualifier of
<b>Category</b>	Character representation
<b>Form of representation</b>	URI
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<a href="http://www.lanl.gov/worldview/">http://www.lanl.gov/worldview/</a>
<b>Permissible values</b>	Uniform Resource Identifier.
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Can include introductory phrase to express date information was checked: Address as of [date]:
<b>MARC/DC crosswalk</b>	<DC>Rights.
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Location Source Code
<b>Identifier</b>	3.1.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Source code of the organization or agency holding the material or providing access to it. This organization or agency is the source of the material being described.
<b>Classification scheme</b>	
<b>Keywords</b>	Source code
<b>Related data reference</b>	Provenance Location
<b>Type of relationship</b>	qualifier of
<b>Category</b>	Character representation
<b>Form of representation</b>	Code
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	6 digit number
<b>Example/Code</b>	428826
<b>Permissible values</b>	When available, use source code listed in DTIC Corporate Source Authority System at: <a href="http://www.dtic.mil/corpsource/">http://www.dtic.mil/corpsource/</a> .
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Rights.
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Custodial History
<b>Identifier</b>	3.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Ownership of the material beginning with its creation through to the point of accession.
<b>Classification scheme</b>	
<b>Keywords</b>	Custodial history; Provenance; Custodianship; Source; History
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	From the collection of... Purchased from creator in 1910 by Anne Hall.
<b>Permissible values</b>	Follow MARC.
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Distinguish between provenance of original and subsequent digital object using repeated fields.
<b>MARC/DC crosswalk</b>	561 / <DC>Source
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable.



### 3.3 Provenance\_Conditional

<b>Element name</b>	Provenance_Conditional_Jurisdiction
<b>Identifier</b>	3.3.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Name of jurisdiction that imposes and/or enforces terms and restrictions.
<b>Classification scheme</b>	
<b>Keywords</b>	Jurisdictional name; Corporate name
<b>Related data reference</b>	Provenance_Conditional_Jurisdiction_Address Provenance_Conditional_Jurisdiction_Source_Code Provenance_Conditional_Jurisdiction_Authorization Provenance_Conditional_Jurisdiction_Authorized_Users
<b>Type of relationship</b>	qualified_by parent_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Naval Air Warfare Center Aircraft Div., Technical Publishing Team.
<b>Permissible values</b>	When available, use form of name listed in DTIC Corporate Source Authority System at: <a href="http://www.dtic.mil/corpsource/">http://www.dtic.mil/corpsource/</a> .
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	540b / <DC>Rights
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable only as element.

<b>Element name</b>	Provenance_Conditional_Jurisdiction_Address
<b>Identifier</b>	3.3.1.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Address of the jurisdiction that imposes and/or enforces terms and restrictions.
<b>Classification scheme</b>	
<b>Keywords</b>	Street address; Mailing address
<b>Related data reference</b>	Provenance_Conditional_Jurisdiction
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	[Street name], [City], [State abbreviation] [Zip code]
<b>Example/Code</b>	3550 Aberdeen Ave., SE, Kirtland, AFB, NM 87117-5776.
<b>Permissible values</b>	When available, use form of address listed in DTIC Corporate Source Authority System at: <a href="http://www.dtic.mil/corpsource/">http://www.dtic.mil/corpsource/</a> .
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	852 / <DC>Rights
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance_Conditional_Jurisdiction_Source_Code
<b>Identifier</b>	3.3.1.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Source code of the jurisdiction that imposes and/or enforces terms and restrictions.
<b>Classification scheme</b>	
<b>Keywords</b>	Source code
<b>Related data reference</b>	Provenance_Conditional_Jurisdiction
<b>Type of relationship</b>	qualifier of
<b>Category</b>	Character representation
<b>Form of representation</b>	Code
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	6 digit number
<b>Example/Code</b>	428826
<b>Permissible values</b>	When available, use source code listed in DTIC Corporate Source Authority System at: <a href="http://www.dtic.mil/corpsource/">http://www.dtic.mil/corpsource/</a> .
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Rights.
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance_Conditional_Jurisdiction_Authorization
<b>Identifier</b>	3.3.1.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Authority source for restriction (statutes, contracts). Include title and version when known.
<b>Classification scheme</b>	
<b>Keywords</b>	Authorization; Statute; Contract; Restriction
<b>Related data reference</b>	Provenance_Conditional_Jurisdiction
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Title 50, chapter 401, U.S.C. Critical Technology
<b>Permissible values</b>	DoD statements in current use: Export Control. Journal Articles: DTIC Users Only. US Gov't only: DOD Controlled. Controlled: DOD Controlled. Export Controlled; DLSE Certified. DOD Only; Non-DOD Controlled. CNWDI (Critical Weapons and Design Information) Further dissemination only as directed.
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Permissible value and its source must be stated as clearly as possible, given the information available. Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	540c / <DC>Rights
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable only as element.

<b>Element name</b>	Provenance_Conditional_Jurisdiction_Authorized_Users
<b>Identifier</b>	3.3.1.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Names/titles of individuals and agencies authorized to be users.
<b>Classification scheme</b>	
<b>Keywords</b>	Authorized names; Authorized users
<b>Related data reference</b>	Provenance_Conditional_Jurisdiction Provenance_Conditional_Jurisdiction_Authorized_Users _Date
<b>Type of relationship</b>	child_of qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Employees with a need to know.
<b>Permissible values</b>	DoD statements in current use: Public release (Unclassified Unlimited) US Gov't and their contractors. US Gov't agencies only. US Gov't ONLY; DoD Controlled. Registered DTIC Users Only DoD and their Contractors. DOD Only; Non-DOD Controlled.
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Permissible value and its source must be stated as clearly as possible, given the information available. Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	540d / <DC>Rights
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable only as element.

<b>Element name</b>	Provenance_Conditional_Jurisdiction_Authorized_Users _Date
<b>Identifier</b>	3.3.1.4.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Date of authority source for restriction.
<b>Classification scheme</b>	
<b>Keywords</b>	Authorization date
<b>Related data reference</b>	Provenance_Conditional_Jurisdiction_Authorized_Users
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Date
<b>Datatype</b>	Date
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	1997:03:03 1996:02
<b>Permissible values</b>	Follow TIFF date/time format: [yyyy:mm:dd] or [yyyy:mm:dd hh:mm:ss]
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	540d / <DC>Rights
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable only as element.

<b>Element name</b>	Provenance Conditional Access
<b>Identifier</b>	3.3.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	Restrictions on access
<b>Context</b>	MARC
<b>Definition</b>	Terms regarding access to the material (digital and analog). Access relates to physical, legal or procedural situations. This includes instances when a password is required for access, access is granted for official use only, or a subscription is required for access as well as instructions for gaining access to physical property at the holdings institution.
<b>Classification scheme</b>	
<b>Keywords</b>	Access terms; Restriction
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Appointment required to examine original material, microfilm or transcripts. Contact the Air Force Historical Research Agency, Maxwell Air Force Base, for further information.
<b>Permissible values</b>	Work from an expandable list of values for this element
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	506a / <DC>Rights
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance_Conditional_Use
<b>Identifier</b>	3.3.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Terms governing use of the material (digital or analog) <u>after</u> access has been provided, particularly related to reproduction, copyright, and other restrictions. NLA: Uses Preservation Action Permission as a statement of whether or not permission is held to create copies of the object for preservation purposes.
<b>Classification scheme</b>	
<b>Keywords</b>	Use terms; Restriction; Reproduction; Copyright
<b>Related data reference</b>	Provenance_Conditional_Use_Rights/Restrictions Provenance_Conditional_Use_Rights_Holder Provenance_Conditional_Use_Credit_Line Provenance_Conditional_Use_Cost(Fee) Provenance_Conditional_Use_Permission
<b>Type of relationship</b>	parent_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	This element can be used to note whether permission is granted for in-house copying, migrating or emulation of the materials. Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	540a / <DC>Rights
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable



<b>Element name</b>	Provenance Conditional Use Rights/Restrictions
<b>Identifier</b>	3.3.3.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Rights and restrictions governing use of the material (digital or analog) <u>after</u> access has been provided, particularly related to reproduction, copyright, and other restrictions.
<b>Classification scheme</b>	
<b>Keywords</b>	Restriction; Rights; Reproduction
<b>Related data reference</b>	Provenance Conditional Use
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Reproduction rights may be restricted through copyright. No reproduction restrictions. Classified.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	540a / <DC>Rights
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance_Conditional_Use_Rights_Holder
<b>Identifier</b>	3.3.3.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Name of rights holder or owner, including holder of copyright, patent, or trademark.
<b>Classification scheme</b>	
<b>Keywords</b>	Rights holder; Copyrighter; Name
<b>Related data reference</b>	Provenance_Conditional_Use
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	540a / <DC>Rights
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance_Conditional_Use_Credit_Line
<b>Identifier</b>	3.3.3.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Formal statement of the ownership or source of the material that is used in a display label or publication.
<b>Classification scheme</b>	
<b>Keywords</b>	Credit line
<b>Related data reference</b>	Provenance_Conditional_Use
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Credit line: Air Force Historical research Agency, Maxwell Air Force Base, AL. Credit line: Courtesy of [name].
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	540a / <DC>Rights
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance_Conditional_Use_Cost(Fee)
<b>Identifier</b>	3.3.3.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Identifies any costs or fees for use of the material, including reproduction in publications or displays. Specifies whether use of the material requires payment.
<b>Classification scheme</b>	
<b>Keywords</b>	Cost; Fee
<b>Related data reference</b>	Provenance_Conditional_Use
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Amount
<b>Datatype</b>	Decimal
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	\$12.00
<b>Permissible values</b>	Monetary amounts.
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	540a / <DC>Rights
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance_Conditional_Use_Permission
<b>Identifier</b>	3.3.3.5
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Track permissions granted for use, including reproduction and other ordering information. Use for record keeping and rights management.
<b>Classification scheme</b>	
<b>Keywords</b>	Permission; Record keeping; Rights management; Ordering
<b>Related data reference</b>	Provenance_Conditional_Use Provenance_Conditional_Use_Permission_Name Provenance_Conditional_Use_Permission_Date
<b>Type of relationship</b>	child_of qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Conditional Use Permission Name
<b>Identifier</b>	3.3.3.5.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Name of person or organization granted permission.
<b>Classification scheme</b>	
<b>Keywords</b>	Personal name; Corporate name
<b>Related data reference</b>	Provenance Conditional Use Permission
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance_Conditional_Use_Permission_Date
<b>Identifier</b>	3.3.3.5.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Date permission was granted.
<b>Classification scheme</b>	
<b>Keywords</b>	Date
<b>Related data reference</b>	Provenance_Conditional_Use_Permission
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Date
<b>Datatype</b>	Date
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	2002:12:12
<b>Permissible values</b>	Follow TIFF date/time format: [yyyy:mm:dd] or [yyyy:mm:dd hh:mm:ss]
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

### 3.4 Provenance\_Action

<b>Element name</b>	Provenance_Action_Method
<b>Identifier</b>	3.4.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>Technique used to perform processing or preservation actions, including format of the manifestation.</p> <p>NLA: Process element includes “all relevant details of any process applied to a digital object or file, including software, specific settings or actions that were required to produce the current manifestation, details of all equipment and responsible agencies or persons.”</p> <p>IU/RKMS: sub-element of action is date/time, type, description, next action and next action due.</p> <p>LOM: Uses Life Cycle for history and current state of object, as well as those who affected it during its evolution.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Action method; Process; Action type; Transformation; Lifecycle
<b>Related data reference</b>	Provenance_Action_Method_Specifications
<b>Type of relationship</b>	parent_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<p>MARC: “reformatted;” and “will reformat.”</p> <p>NLA: conversion of .wav to .aiff; copy from floppy disk to CD-R.</p> <p>IU/RKMS: backed-up; imaged; medium refreshed; microfilmed; migrated.</p>
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action. Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	583a and i / <DC>Format
<b>Source</b>	



<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable only as element.

<b>Element name</b>	Provenance_Action_Method_Specifications
<b>Identifier</b>	3.4.1.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Information about processing action. LC/CORE and CF: capture_device_settings contains variables applied to equipment used for digital capture.
<b>Classification scheme</b>	
<b>Keywords</b>	Action settings; Specifications
<b>Related data reference</b>	Provenance_Action_Method
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	File was scanned with batch 69 with OCR turned on. The relevant files were identified and batch scanned with the OCR option turned off.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	583x / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Composition
<b>Identifier</b>	3.4.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Physical description of material that was reformatted. Can include number of items and/or dimensions. NLA/PMWG uses Technical Infrastructure of Complex Object, which enumerates the components of the digital object and its interrelationships, including the number of files and types of each file.
<b>Classification scheme</b>	
<b>Keywords</b>	Composition; Substance of material; Infrastructure
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	(53 items) Web page consists of one ASCII HTML file, three embedded static GIF files and one embedded audio WAV file. CD-ROM containing 22 files – 14 .gif image files, 3 .wav audio files, 3 .txt files and 2 .ex executables assembled in accordance with ISO 9660.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	533e / <DC>Format.Extent
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Software
<b>Identifier</b>	3.4.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Information about software applications used to process. RLG: Name of software, including version, settings, etc.
<b>Classification scheme</b>	
<b>Keywords</b>	Software; Capture
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Gathered using Harvest version 2.2; File save, using Netscape.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	583x / <DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Hardware
<b>Identifier</b>	3.4.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Information about hardware equipment. LC/CORE and CF: capture_device_ID is the equipment used for digital capture, including all elements in digitization production system (manufacturer, model no., serial no., etc.). RLG: Capture device: make and model of digital camera or scanner. NISO: Uses HostComputer and DeviceSource to describe hardware at the time of file creation.
<b>Classification scheme</b>	
<b>Keywords</b>	Hardware; Capture
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Brand and model of digital camera; Brand and model of digital converter; Brand and model of scanner.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	583x / <DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Date Time
<b>Identifier</b>	3.4.5
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Date, or date range, in which the action or process was performed. NLA: Date that this manifestation of the object or file came into being.
<b>Classification scheme</b>	
<b>Keywords</b>	Datetime
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Date
<b>Datatype</b>	Date
<b>Maximum size</b>	Not to exceed 20 digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	1985:11:23
<b>Permissible values</b>	Follow TIFF date/time format: [yyyy:mm:dd] or [yyyy:mm:dd hh:mm:ss]
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	583c / <DC>Format.DateModified
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable only as element

<b>Element name</b>	Provenance Action Date Time Interval
<b>Identifier</b>	3.4.5.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Time period that cannot be expressed as a specific date. Can be used to represent a schedule of publication, migration, backup, or to track inspection or appraisal.
<b>Classification scheme</b>	
<b>Keywords</b>	Time interval; Schedule
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Biannually.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action. Includes start and end times, start and duration, and duration and end times.
<b>MARC/DC crosswalk</b>	583d / <DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Modification History
<b>Identifier</b>	3.4.6
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Note pertaining to details of modification. NEDLIB/MD: Information about every change that has occurred in the digital object and which has implied a change in any metadata for long term preservation
<b>Classification scheme</b>	
<b>Keywords</b>	Change history; Modification
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	NLA: File names were modified to display through nph-arch program; Data now stored in standard Word 97 format.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action. Also use for PMWG and NLA Quirks information (e.g., The Shockwave files could not be captured from the source document).
<b>MARC/DC crosswalk</b>	533n / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable



<b>Element name</b>	Provenance_Action_Site
<b>Identifier</b>	3.4.7
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	ScanningAgency
<b>Context</b>	NISO
<b>Definition</b>	Name of agency performing action or process. NISO: Uses "ScanningAgency" to identify the organization-level producer/s of the file. RLG: Producer is the agency responsible for the physical creation of the file. Record the name of the agency responsible for the actual creation of the file, not the delegating agency.
<b>Classification scheme</b>	
<b>Keywords</b>	Action site; Scanning agency; Producer; Corporate name
<b>Related data reference</b>	Provenance_Action_Site_Place Provenance_Action_Site_Agent
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Luna Imaging, Inc.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	583j / <DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Site Place
<b>Identifier</b>	3.4.7.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Geographic location of agency where action or process was performed.
<b>Classification scheme</b>	
<b>Keywords</b>	Scanning location; Site place
<b>Related data reference</b>	Provenance Action Site
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	[name of city], [2 digit state abbreviation]
<b>Example/Code</b>	Fort Belvoir, VA
<b>Permissible values</b>	When available, use form of name listed in DTIC Corporate Source Authority System at: <a href="http://www.dtic.mil/corpsource/">http://www.dtic.mil/corpsource/</a> .
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	533b / <DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Site Agent
<b>Identifier</b>	3.4.7.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>Person or organization performing the action or applying the process.</p> <p>RLG: Optionally, identify the individual primarily responsible for scanning.</p> <p>LC/CORE and CF: capture_entity_corporate and capture_entity_individual identifies producers of the file/bitstream.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Agent; Personal name; Producer
<b>Related data reference</b>	Provenance Action Site
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Beatrice O'Leary.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	583k / <DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Agency
<b>Identifier</b>	3.4.8
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Name of the agency responsible for the initiating the processing or preservation action.
<b>Classification scheme</b>	
<b>Keywords</b>	Action agency; Responsible agency
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Defense Technical Information Center
<b>Permissible values</b>	When available, use form of name listed in DTIC Corporate Source Authority System at: <a href="http://www.dtic.mil/corpsource/">http://www.dtic.mil/corpsource/</a> .
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	533c / <DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Status
<b>Identifier</b>	3.4.9
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Status of material resulting from action. NLA defines this as result, to note the success or otherwise of the process. ADN: Following IMS (and LOM), uses Draft, Final, Revised, Unavailable. Digital Library for Earth System Education (DLESE, part of the ADN group) added Unknown.
<b>Classification scheme</b>	
<b>Keywords</b>	Action status; Result
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Reformatted Revision NLA: File successfully converted; File converted, however, data was lost from the header.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	583l / <DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Provenance Action Label
<b>Identifier</b>	3.4.10
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Information about reformatting action to display to end user.
<b>Classification scheme</b>	
<b>Keywords</b>	Action label; Display
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Digitally remastered under auspices of the Defense Virtual Library for the Defense Technical Information Center.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Use this element only when describing processing or preservation action.
<b>MARC/DC crosswalk</b>	583z / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

#### 4.0 Fixity Information

<b>Element name</b>	Fixity_Checksum
<b>Identifier</b>	4.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Alphanumeric value used for data validation. LC/CORE and CF: Value created by MD5 program, used to verify data integrity. NISO: Local repository policies regarding file integrity metadata should govern implementation of this field. RLG: algorithm based on a manipulation of the sum of the bits that make up a file to yield a number that serves as a unique identifier for that file. Used as a validation key.
<b>Classification scheme</b>	
<b>Keywords</b>	Checksum; Algorithm; Validation
<b>Related data reference</b>	Fixity_Checksum_Date_Time Fixity_Checksum_Type
<b>Type of relationship</b>	qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	57edf4a22be3c955ac49da2e2107b67a
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Not repeatable

<b>Element name</b>	Fixity_Checksum_Date_Time
<b>Identifier</b>	4.1.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	LC/CORE and CF: Date and time checksum created. NISO: The enumerated type values should be defined locally, as should the rule regarding when the checksum is generated: prior to deposit, at the time of deposit, or both.
<b>Classification scheme</b>	
<b>Keywords</b>	Checksum datetime
<b>Related data reference</b>	Fixity_Checksum Fixity_Checksum_Date_Time_Qualifier
<b>Type of relationship</b>	qualifier_of qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Date
<b>Datatype</b>	Date
<b>Maximum size</b>	Not to exceed 20 digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	1999-04-12
<b>Permissible values</b>	Follow TIFF date/time format: [yyyy:mm:dd] or [yyyy:mm:dd hh:mm:ss].
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Not repeatable



<b>Element name</b>	Fixity_Checksum_Date_Time_Qualifier
<b>Identifier</b>	4.1.1.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Describes date and time when checksum is generated, e.g. at file creation, at the time of deposit, when modified or when accessed.
<b>Classification scheme</b>	
<b>Keywords</b>	Checksum datetime qualifier
<b>Related data reference</b>	Fixity_Checksum_Date_Time
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed 20 digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Creation Modification
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Not repeatable

<b>Element name</b>	Fixity_Checksum_Type
<b>Identifier</b>	4.1.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Type of algorithm used. NLA: Validation mechanism verifying authenticity. CEDARS: Authentication indicator is sub-element of fixity information.
<b>Classification scheme</b>	
<b>Keywords</b>	Checksum type; Validation mechanism; Authentication
<b>Related data reference</b>	Fixity_Checksum
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Standard internet checksum Roland checksum MD5 RSA-MD4
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element. May want to broaden scope to include Error Detection and Correction (EDAC), e.g. Reed-Solomon.
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Not repeatable

<b>Element name</b>	Fixity_Access_Inhibitor
<b>Identifier</b>	4.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	NLA: Access inhibitor includes encryption, watermarking and password protection. It is defined as any method used to inhibit access that impacts on preservation procedures. PMWG defines these features as Access inhibitors (encryption, watermarking, password protection). Identifies access facilitators (navigational links) as an element. NAA: Use in conjunction with sub-element for Digital signature.
<b>Classification scheme</b>	
<b>Keywords</b>	Access inhibitor; Security
<b>Related data reference</b>	Fixity_Access_Inhibitor_Encryption Fixity_Access_Inhibitor_Watermark Fixity_Access_Inhibitor_Password_Protection Fixity_Access_Inhibitor_Digital_Signature
<b>Type of relationship</b>	parent_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	PMWG places access inhibitors in Representation Information.
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Fixity Access Inhibitor Encryption
<b>Identifier</b>	4.2.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	PITT: Encryption Method identifies the algorithms used by the record originator to encrypt the record's content.
<b>Classification scheme</b>	
<b>Keywords</b>	Encryption
<b>Related data reference</b>	Fixity Access Inhibitor
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	RSA Public Key Cryptosystem.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Fixity Access Inhibitor Watermark
<b>Identifier</b>	4.2.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Webopedia definition: A pattern of bits inserted into a digital image, audio or video file that identifies the file's copyright information (author, rights, etc.). The purpose of digital watermarks is to provide copyright protection for intellectual property that's in digital format. Unlike printed watermarks, which are intended to be somewhat visible, digital watermarks are designed to be completely invisible, or in the case of audio clips, inaudible.
<b>Classification scheme</b>	
<b>Keywords</b>	Watermark; Steganography
<b>Related data reference</b>	Fixity Access Inhibitor
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Watermark by Invisible Ink for Images embedded before acquisition. Watermark by Digimarc Professional.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Fixity_Access_Inhibitor_Password_Protection
<b>Identifier</b>	4.2.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	High-Tech Dictionary: "A technology that allows a system to assign login names and passwords to users. Files and directories are protected from unauthorized access by requiring users to enter a password before access is allowed."
<b>Classification scheme</b>	
<b>Keywords</b>	Password protection; User authorization; Login
<b>Related data reference</b>	Fixity_Access_Inhibitor
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Use password.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Fixity Access Inhibitor Digital Signature
<b>Identifier</b>	4.2.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>A digital signature ensures that the document originated with the person signing it and that it was not tampered with after the signature was applied. However, the sender could be an impersonator and not the person claimed. To verify that the message was sent by the person claiming to send it requires a digital certificate (digital ID) issued by a certification authority.</p> <p>NEDLIB "Metadata for the Long Term Preservation of Electronic Publications" defines digital signature as "a digital code that can be attached to an electronically transmitted message that uniquely identifies the sender."</p> <p>NAA: An encrypted, tamper-proof piece of data which creates a unique and unforgeable identifier of the Document Author, Record Creator, Transactors, or Action Officers.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Digital signature
<b>Related data reference</b>	Fixity Access Inhibitor
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Digital Signature Algorithm
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Conditional
<b>Maximum occurrence</b>	Repeatable

## 5.0 Representation Information

<b>Element name</b>	Representation_Composition
<b>Identifier</b>	5.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Physical description of material. Can include number of items and/or dimensions. NLA/PMWG uses Technical Infrastructure of Complex Object, which enumerates the components of the digital object and its interrelationships, including the number of files and types of each file.
<b>Classification scheme</b>	
<b>Keywords</b>	Composition; Physical description; Technical infrastructure; Substance
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	(53 items) Web page consists of one ASCII HTML file, three embedded static GIF files and one embedded audio WAV file. CD-ROM containing 22 files – 14 .gif image files, 3 .wav audio files, 3 .txt files and 2 .ex executables assembled in accordance with ISO 9660.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	533e / <DC>Format.Extent
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable



<b>Element name</b>	Representation File Modality
<b>Identifier</b>	5.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>Expression of type of material (media/medium) being described.</p> <p>PITT: File modality (text, numeric, graphic, geographic, image, sound, video, multimedia, etc.)</p> <p>CEDARS: File modality is a “higher level of Element Name, similar to Dublin Core ‘Type,’ i.e. text, graphic, sound, video, etc.”</p> <p>NLA/PMWG: Uses term ‘structural type’ to describe object (image, sound, video, text, database, software, web document or multi-media).</p> <p>NAA: Media format includes audio, compound, image, text and video.</p> <p>IU/RKMS: Media format identifies the type of data representation and file types; generic format.</p> <p>ADN: Controlled vocabulary for Educational.LearningResourceType.Langstgring includes list subdivided into the following areas: audio, data, learning materials, portal, service, text, tool, visual (<a href="http://www.dlese.org/Metadata/vocabularies/vocabs.htm">http://www.dlese.org/Metadata/vocabularies/vocabs.htm</a>).</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Media Type; Structural type; Media format; File modality
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed 512 digits/characters.
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<p>Image.</p> <p>Photograph.</p> <p>Clip of audio.</p> <p>Segment of videorecording.</p> <p>Interactive multimedia.</p> <p>Text.</p> <p>Audio.</p> <p>Video.</p> <p>Application.</p>
<b>Permissible values</b>	

<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values for this element. iLumina element "TechnicalMediatype includes categories: <a href="http://dl.uncwil.edu/documents/datacategories.htm">http://dl.uncwil.edu/documents/datacategories.htm</a>
<b>MARC/DC crosswalk</b>	856/3 / <DC>Format
<b>Source</b>	CDL automatically generated from defaults
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Not repeatable

<b>Element name</b>	Representation_Format_Type
<b>Identifier</b>	5.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>Code or textual information about format type.</p> <p>MARC21: Identification of the electronic format type; can use enumerated lists like registered MIME types or record textual information.</p> <p>PITT: File Data Representation identifies the data encoding standards used by the file (ASCII, EBCDIC, UNICODE, CCITT Group III raster, etc).</p> <p>NISO: Uses MIME type.</p> <p>IU/RKMS: Uses data format to identify the encoding standards used to represent the record.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Format type; MIME type; File data
<b>Related data reference</b>	Representation_File_Extension Representation_Format_Type_Version
<b>Type of relationship</b>	parent_of qualified_by
<b>Category</b>	Character representation
<b>Form of representation</b>	Code
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed 64 digits/characters.
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<p>html</p> <p>ascii</p> <p>jpeg</p> <p>tif</p> <p>gif</p> <p>mpg</p> <p>AIFF interleaved</p> <p>Quicktime</p> <p>IMS: non-digital</p>
<b>Permissible values</b>	<p>What is.com: Every File Format in the World: <a href="http://whatis.techtarget.com/fileFormatG/0,289943,sid9,00.html">http://whatis.techtarget.com/fileFormatG/0,289943,sid9,00.html</a></p> <p>Computer High-Tech Dictionary, File Types: <a href="http://www.computeruser.com/resources/dictionary/filetypes.html">http://www.computeruser.com/resources/dictionary/filetypes.html</a></p> <p>Fretext or MIME type at: <a href="http://www.isi.edu/in-notes/iana/assignments/media-types/media-types">http://www.isi.edu/in-notes/iana/assignments/media-types/media-types</a></p>

<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	856q / <DC>Format.
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation Format Type File Extension
<b>Identifier</b>	5.3.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	Format
<b>Context</b>	NISO
<b>Definition</b>	3 character string (code) describing file format. NISO: Uses Format to record 3-character name corresponding to the standard file extension.
<b>Classification scheme</b>	
<b>Keywords</b>	File extension
<b>Related data reference</b>	Representation Format Type
<b>Type of relationship</b>	child of
<b>Category</b>	Character representation
<b>Form of representation</b>	Code
<b>Datatype</b>	Character
<b>Maximum size</b>	3
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	GIF JPG TIF
<b>Permissible values</b>	What is.com: Every File Format in the World: <a href="http://whatis.techtarget.com/fileFormatG/0,289943,sid9,0,0.html">http://whatis.techtarget.com/fileFormatG/0,289943,sid9,0,0.html</a> Computer High-Tech Dictionary, File Types: <a href="http://www.computeruser.com/resources/dictionary/filetypes.html">http://www.computeruser.com/resources/dictionary/filetypes.html</a>
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	Automatically generated.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation _Format_ Type_ Version
<b>Identifier</b>	5.3.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Names, codes, numbers, or text that distinguish one version of the format from others.
<b>Classification scheme</b>	
<b>Keywords</b>	Version
<b>Related data reference</b>	Representation _Format_ Type
<b>Type of relationship</b>	qualifier_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed 64 digits/characters.
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	1.1 4.0
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation File Size
<b>Identifier</b>	5.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Actual uncompressed size. MOA: distinguishes between size of object sent to client/tool and size of object stored and captured. NLA: Term 'storage information' indicates storage capacity on physical format.
<b>Classification scheme</b>	
<b>Keywords</b>	File size
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Integer
<b>Maximum size</b>	Not to exceed 64 digits/characters.
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	43370 bytes 19602 bytes
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Initial DVL entries used KB, not bytes, per DVL staff. Since most projects specify that bytes be used, it is anticipated that future DVL work will use bytes.
<b>MARC/DC crosswalk</b>	856s / <DC>Format.Extent
<b>Source</b>	CDL not supported.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Compression
<b>Identifier</b>	5.5
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>CDL: Type of algorithm needed to decompress the image, with note of software package used to apply the format, and degree/percentage of compression used where options exist.</p> <p>LC/CORE: datastream_compression is algorithm used to compress the terminal object.</p> <p>AVPP: Video compression is the type and amount of digital compression, e.g. Predictive-10:1, RLE-2:1.</p> <p>NEDLIB: process of reducing number of bits required to store or transmit info.</p> <p>RLG: Whether the file has been compressed/reduced in size.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Compression
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Code
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<p>Photo: TIFF; CCIT 4; JPEG; LZW</p> <p>Sound: WAV; MPEG3</p> <p>Video: MPEG1; Predictive-10:1, RLE-2:1</p> <p>Digital Object: .zip file</p>
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values for this element. Bit-rate reduction. Audio and video are lossy, non-reversible.
<b>MARC/DC crosswalk</b>	856c / <DC>Format
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable



<b>Element name</b>	Representation Physical Carrier
<b>Identifier</b>	5.6
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	Medium
<b>Context</b>	NAA
<b>Definition</b>	Description of physical carrier on which the material is stored. IU/RKMS: physical medium on which record is stored (CD-R, hard disk, microfilm, videotape). NAA: Uses Medium with options CD-R, DVD, floppy disk, hard disk, WORM, ZIP drive.
<b>Classification scheme</b>	
<b>Keywords</b>	Physical carrier; Medium
<b>Related data reference</b>	
<b>Type of relationship</b>	
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	CD-R WORM
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values.
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Requirements
<b>Identifier</b>	5.7
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Contains general description of system requirements. NLA: System or software necessary to access the information in the object or to use it. State whether the requirements are preferred or mandatory. ADN: Extends IMS type vocabulary (operating system, browser) to add in plug-in, subscription, membership and software.
<b>Classification scheme</b>	
<b>Keywords</b>	System requirements
<b>Related data reference</b>	Representation_Requirements_Installation Representation_Requirements_System Representation_Requirements_Software Representation_Requirements_Hardware Representation_Requirements_Operating_System Representation_Requirements_Peripheral
<b>Type of relationship</b>	parent_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	System requirements: Windows 95, Netscape Navigator v 4.0.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	538a <DC>Format
<b>Source</b>	Optional
<b>Applicable to all formats</b>	All
<b>Obligation</b>	
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Requirements_Installation
<b>Identifier</b>	5.7.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	PMWG: any specialized procedures needed to install an object. NLA: Record specific instructions on passwords, how to start the program, etc. ADN: Description on how to install the resource, software, or plug-ins in order to access, interact with or execute the resource.
<b>Classification scheme</b>	
<b>Keywords</b>	Installation requirements
<b>Related data reference</b>	Representation_Requirements
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Computer must be re-booted after installation. Copy to C drive and click on icon.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Requirements_System
<b>Identifier</b>	5.7.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Detailed system information about hardware, software, or peripheral requirements. PMWG: Uses Underlying Abstract Form Description for a human readable description of the content data object.
<b>Classification scheme</b>	
<b>Keywords</b>	System specifics
<b>Related data reference</b>	Representation_Requirements
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	16 MB RAM
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	538 / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Requirements_Software
<b>Identifier</b>	5.7.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Information about software applications used to render the material, including the name, version, registration information and display information (e.g. font sets). RLG: Name of software, including version, settings, etc. PMWG Environment Description component includes Software Environment Rendering Programs ( <i>Transformation Process</i> , Transformer Engine, Parameters, Input format, Output format, Location, Documentation, <i>Display/Access Application</i> , Input format, Output format, Location, Documentation).
<b>Classification scheme</b>	
<b>Keywords</b>	Software requirements
<b>Related data reference</b>	Representation_Requirements
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Adobe Acrobat Reader: must use PDF files.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	583x / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Requirements_Hardware
<b>Identifier</b>	5.7.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Information about hardware needed to render the material, including the name, model number, configuration and output information (e.g. viewers required). RLG: Name of hardware, including version and settings. NEDLIB/MD: Description of non-standard platform configuration or hardware requirements (sub-elements Microprocessor, Multimedia device, Peripheral device).
<b>Classification scheme</b>	
<b>Keywords</b>	Hardware requirements
<b>Related data reference</b>	Representation_Requirements
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Intel Pentium III microprocessor required; 128 MB RAM.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	583x / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Requirements_Operating_System
<b>Identifier</b>	5.7.5
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>Information about the operating system needed to render the material, including the name, version, configuration and other information.</p> <p>PMWG Environment Description component includes Software Environment Rendering Programs (<i>Operating System</i> name, version, Location, Documentation).</p> <p>ADN: extends IMS name vocabulary (PC-DOS, MS-Windows, MacOS, Unix, Multi-OS, Other, None, Any, Netscape, Microsoft Internet Explorer) to include Unknown, Shockwave Flash Player, Real Player, QuickTime, Adobe Acrobat, Platform emulation.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Operating system requirements
<b>Related data reference</b>	Representation_Requirements
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<p>Windows 98 and higher.</p> <p>MS-Windows</p> <p>PC-DOS</p> <p>MacOS</p> <p>Unix</p> <p>Multi-OS</p>
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	583x / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Requirements_Peripheral
<b>Identifier</b>	5.7.6
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Information about peripherals needed to render the material, including the name, model number, configuration and other information. NEDLIB/MD: Description of non-standard peripheral devices.
<b>Classification scheme</b>	
<b>Keywords</b>	Peripheral requirements
<b>Related data reference</b>	Representation_Requirements
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	ZIP storage device; CD-ROM drive
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	583x / <DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable



<b>Element name</b>	Representation_Delivery_Method
<b>Identifier</b>	5.8
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Access method that makes the online resource available.
<b>Classification scheme</b>	
<b>Keywords</b>	Delivery method; Online access
<b>Related data reference</b>	Representation_Delivery_Method_Format Representation_Delivery_Method_Display
<b>Type of relationship</b>	parent_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	email ftp dial-up http
<b>Permissible values</b>	Can incorporate IMS use of specific browser names as needed: Any, Netscape Communicator, Microsoft Internet Explorer, Opera, Other.
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	856/_1
<b>Source</b>	Automatically generated.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Delivery_Method_Format
<b>Identifier</b>	5.8.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>Format in which item is delivered to the user.</p> <p>CEDARS: Formats that enable access to the bit stream</p> <p>MOA: Indicates requirements for playback/viewing.</p> <p>NDLP: Indicates the nature of the data found in the content portion of the data element (if applicable, express as MIME type).</p> <p>NEDLIB: Format is the arrangement of data for computer input/output.</p> <p>NISO: Uses MIME Type and Format (3 character name, like extension)</p> <p>NLA: Encapsulation is the delivery format and the version, (e.g. Real Audio II).</p> <p>IU/RKMS: Uses the term standards to identify standards (e.g. TIFF) applied to the record that affect how it can be rendered.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Delivery format; MIME type
<b>Related data reference</b>	Representation_Delivery_Method
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Code
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed 10 digits/characters.
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<p>Photo: JPEG; GIF; TIFF</p> <p>Sound: RA; WAV; AU; RM</p> <p>Video: MPEG1; RM; AVI; Quicktime</p> <p>Digital Object: pdf; ZIP</p>
<b>Permissible values</b>	<p>Use MIME type.</p> <p>What is.com: Every File Format in the World:  <a href="http://whatis.techtarget.com/fileFormatG/0,289943,sid9,00.html">http://whatis.techtarget.com/fileFormatG/0,289943,sid9,00.html</a></p> <p>Computer High-Tech Dictionary, File Types:  <a href="http://www.computeruser.com/resources/dictionary/filetypes.html">http://www.computeruser.com/resources/dictionary/filetypes.html</a></p>
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center

Refer to Sources Consulted (Appendix D) for acronym names and references.

<b>Comment</b>	Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	Automatically generated.
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Delivery_Method_Display
<b>Identifier</b>	5.8.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	NISO: Uses PreferredPresentation to designate device, application, medium, viewing environment, etc. to render the data.
<b>Classification scheme</b>	
<b>Keywords</b>	Preferred presentation; Display details
<b>Related data reference</b>	Representation_Delivery_Method
<b>Type of relationship</b>	child of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	45 MB free hard disk space required to install the program.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	All
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

## 5.9 Representation\_Format\_Details

### 5.9.1 Representation\_Format\_Details\_Image

<b>Element name</b>	Representation_Format_Details_Image_Orientation
<b>Identifier</b>	5.9.1.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	NISO: Orientation presented to a conventional monitor.
<b>Classification scheme</b>	
<b>Keywords</b>	Image orientation; Portrait; Landscape
<b>Related data reference</b>	Representation_Format_Details_Image
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Not to exceed 10 digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	
<b>Permissible values</b>	Portrait Landscape
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	Only images
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation Format Details Image Color Space
<b>Identifier</b>	5.9.1.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>Method used to represent color for display and printing. CDL: Color space used, often needed by viewer; indicates whether image was initially created for onscreen display or for pre-press output. (Some color space parameters such as white point may require individual tags.)</p> <p>CDL Best Practices: Number of channels.</p> <p>DIG35: Specifies the colorspace of the decompressed image data. Details component information (e.g. RGB) separately.</p> <p>MOA: Scanner profile describes the color artifacts introduced by the scanner; need to map images into standard color space and adjust for display/printing. Indicates creation for onscreen display or prepress output.</p> <p>NISO: Uses "PhotometricInterpretation" to designate the color space of the decompressed image data. Uses SamplesPerPixel to designate the number of color components per pixel.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Color space; Photometric interpretation; Samples per pixel
<b>Related data reference</b>	Representation Format Details Image
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	CMYK RGB Grayscale CIELab
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from expandable list of values for this element.

Refer to Sources Consulted (Appendix D) for acronym names and references.

<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	Only images.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Format_Details_Image_Color_Management
<b>Identifier</b>	5.9.1.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	On-screen proofing capabilities. NLA and RLG: system used to improve consistency of color across capture, display and output of image. CDL Best Practices: software that controls capture and reproduction of color.
<b>Classification scheme</b>	
<b>Keywords</b>	Color management
<b>Related data reference</b>	Representation_Format_Details_Image
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	PhotoCD OptiCal Profile/80 Softproof Photoshop 5
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from expandable list of values for this element.
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	Only images
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable



<b>Element name</b>	Representation Format Details Image Resolution
<b>Identifier</b>	5.9.1.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	LC/CORE: dpi, complements but not the same as pixels horizontal and vertical. MOA: settings on scanning device (dimensions or dpi). NDLP: Quality or sharpness of image, expressed in dpi. NLA: spatial resolution in ppi or dpi. NEDLIB: Measure of sharpness in screens. RLG: Number of pixels used to represent the scanned item (either pixel dimensions, ppi or dpi).
<b>Classification scheme</b>	
<b>Keywords</b>	Resolution; Spatial resolution; dots per inch (dpi)
<b>Related data reference</b>	Representation Format Details Image
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	200 dpi (8x10 image) 400 dpi interpolated to 600 dpi
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	Only images.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Format_Details_Image_Dimension
<b>Identifier</b>	5.9.1.5
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	MOA: provided in pixels, indication of quality of image. Distinguishes between dimensions of object sent to client/tool and dimensions of object stored and captured. NLA: image dimension is number of pixels along the vertical and horizontal dimensions. CDL Best Practices: Resolution of capture is the number of pixels per inch in both height and width that are sampled from the original to create the digital image.
<b>Classification scheme</b>	
<b>Keywords</b>	Dimensions; Pixels per inch
<b>Related data reference</b>	Representation_Format_Details_Image
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	Use Format: [www:hhhh]
<b>Example/Code</b>	1200:1600 pixels 4096:6144 pixels
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	Only images.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation Format Details Image Bit Depth
<b>Identifier</b>	5.9.1.6
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>LC/CORE and CF: Number of bits per pixel conveying color information.</p> <p>NDLP: Number of different colors or shades of gray that can be stored in each pixel of a scanned image. Also referred to as color depth; expressed as number of bits per pixel. Color mode indicates associated colors or shades of gray (bitonal, color, or grayscale).</p> <p>NLA: Uses Image Tonal Resolution to express bit depth of each pixel and whether multiple bits convey gray tones or color.</p> <p>CDL Best Practices: Number of bits of color data to store the image data for one pixel.</p> <p>NISO: Uses BitsPerSample to represent number of bits per component for each pixel.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Bit depth; Color depth; Image tonal resolution
<b>Related data reference</b>	Representation Format Details Image
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<p>24 bit color (RGB)</p> <p>8 bit grayscale</p> <p>8 bit color</p> <p>binary (b&amp;w)</p>
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	007c/06-08 / <DC>Format
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	Only images.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

## 5.9.2 Representation\_Format\_Details\_Audio

<b>Element name</b>	Representation_Format_Details_Audio_Channel Information
<b>Identifier</b>	5.9.2.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	LC/CORE and CF: Additional information about audio channel configuration (languages, channels to speakers). AVPP: Number and information about channels/tracks. NLA: Uses Track Number and Type to state number of tracks and their relationship. HAR: Uses Number of channels to designate the number of audio channels present. Uses Sound channel map (with subelements of assignment, number, and location).
<b>Classification scheme</b>	
<b>Keywords</b>	Audio channel; Track number; Track type; Number of channels
<b>Related data reference</b>	Representation_Format_Details_Audio
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	2-trk 4-trk 8-trk 2 track stereo 5 channel surround
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	Only audio
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Format_Details_Audio_Duration
<b>Identifier</b>	5.9.2.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Playing time of performance or recording, entered according to standard time format.
<b>Classification scheme</b>	
<b>Keywords</b>	Running time; Duration
<b>Related data reference</b>	Representation_Format_Details_Audio
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Time
<b>Datatype</b>	Integer
<b>Maximum size</b>	Not to exceed 12 digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	01:20:45
<b>Permissible values</b>	Follow TIFF date/time format: [hh:mm:ss].
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	306 / <DC>Description
<b>Source</b>	
<b>Applicable to all formats</b>	Only audio.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation Format Details Audio Sound
<b>Identifier</b>	5.9.2.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	LC/CORE and CF: Indicator for audio channel configuration (stereo, mono, surround sound, etc.) AVPP: Sound field is aural space on source recording, e.g. monophonic, stereophonic, surround. HAR: Uses Sound field for aural space on sound recording.
<b>Classification scheme</b>	
<b>Keywords</b>	Audio channel configuration; Sound field; Aural space
<b>Related data reference</b>	Representation Format Details Audio
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Stereophonic Monophonic Surround
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	Only audio.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation Format Details Audio Resolution
<b>Identifier</b>	5.9.2.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	<p>LC/CORE: Number of samples per second.</p> <p>NLA: uses audio resolution for sampling frequency in kHz.</p> <p>Techtarget definition: "The more samples taken per second, the more accurate the digital representation of the sound can be. For example, the current sample rate for CD-quality audio is 44,100 samples per second."</p> <p>AVPP: Rate at which the audio was sampled.</p> <p>HAR: Uses Sample rate to designate the number of samples per second in sample frames.</p>
<b>Classification scheme</b>	
<b>Keywords</b>	Resolution; Sampling frequency; kHz; Sample rate
<b>Related data reference</b>	Representation Format Details Audio
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	<p>44.1 kHz</p> <p>96 kHz</p>
<b>Permissible values</b>	Generally 32, 44.1, 48, 88.2, 96 or 192.
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable list of values for this element.
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	Only audio.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation Format Details Audio Bit Depth
<b>Identifier</b>	5.9.2.5
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	LC/CORE and CF: Number of bits per sample (bps). NLA: Audio bit rate is word length to encode audio, indicating dynamic range. AVPP: Number of bits in a digital audio sample. HAR: Uses bit depth to designate the number of bits per sample point of audio data.
<b>Classification scheme</b>	
<b>Keywords</b>	Bit depth; Audio bit rate; Bits per sample
<b>Related data reference</b>	Representation Format Details Audio
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	16 bps 24 bps
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	007c/06-08 / <DC>Format
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	Only audio.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable



### 5.9.3 Representation\_Format\_Details\_Video

<b>Element name</b>	Representation_Format_Details_Video_Frame_Rate
<b>Identifier</b>	5.9.3.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	LC/CORE and CF: Rate at which a video plays back in frames per second (fps). NLA: Standard frame rate per second of the video. AVPP: Uses 'frames' to represent number of frames and frame rate of video source item.
<b>Classification scheme</b>	
<b>Keywords</b>	Video frame rate; Frames per second
<b>Related data reference</b>	Representation_Format_Details_Video
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	25 fps
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	Only video
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Format_Details_Video_Data_Rate
<b>Identifier</b>	5.9.3.2
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	AVPP, CF and LC/CORE: Data rate of video source item in megabits per second (mbps).
<b>Classification scheme</b>	
<b>Keywords</b>	Video data rate; Megabits per second (mbps)
<b>Related data reference</b>	Representation_Format_Details_Video
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Decimal
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	4.0, 8.25, 100.0
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	Only video
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Format_Details_Video_Duration
<b>Identifier</b>	5.9.3.3
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Playing time of performance or recording, entered according to standard time format.
<b>Classification scheme</b>	
<b>Keywords</b>	Running time; Duration
<b>Related data reference</b>	Representation_Format_Details_Video
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Time
<b>Datatype</b>	Integer
<b>Maximum size</b>	Not to exceed 12 digits/characters
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	01:20:45
<b>Permissible values</b>	Follow TIFF date/time format: [hh:mm:ss].
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	306 / <DC>Description
<b>Source</b>	
<b>Applicable to all formats</b>	Only video.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation Format Details Video Sound
<b>Identifier</b>	5.9.3.4
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	AVPP: Uses sound field for digital sound format used in the video source item, e.g. mono, stereo, DTS, etc. NLA: Uses Video Sound to express the sound parameters where they are incorporated into a single video file structure.
<b>Classification scheme</b>	
<b>Keywords</b>	Video sound; Channel configuration; Sound field; Aural space
<b>Related data reference</b>	Representation Format Details Video
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Stereophonic Monophonic Surround DTS
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	Only video
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Format_Details_Video_Resolution
<b>Identifier</b>	5.9.3.5
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	MOA: provided in pixels, indication of image quality. Distinguishes between dimensions of object sent to client/tool and dimensions of object stored and captured. METS: Distinguishes between pixels_horizontal and pixels_vertical for size of a frame in picture elements. NLA: video frame dimension is resolution in pixels of a single still frame. AVPP: Horizontal and vertical dimensions in pixels and aspect ratio of the frame.
<b>Classification scheme</b>	
<b>Keywords</b>	Resolution; Pixels; Video frame dimension
<b>Related data reference</b>	Representation_Format_Details_Video
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	Use format: [www:hhhh]
<b>Example/Code</b>	0176:0120 0640:0480
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	Automatically generated from defaults.
<b>Applicable to all formats</b>	Only video.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

<b>Element name</b>	Representation_Format_Details_Video_Bit_Depth
<b>Identifier</b>	5.9.3.6
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	METS: Number of bits of sample depth, e.g. 8, 24.
<b>Classification scheme</b>	
<b>Keywords</b>	Bit depth; Bits per sample
<b>Related data reference</b>	Representation_Format_Details_Video_
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Measure
<b>Datatype</b>	Integer
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	32 bit color
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	Work from an expandable set of values for this element.
<b>MARC/DC crosswalk</b>	007c/06-08 / <DC>Format
<b>Source</b>	CDL automatically generated from defaults.
<b>Applicable to all formats</b>	Only video.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

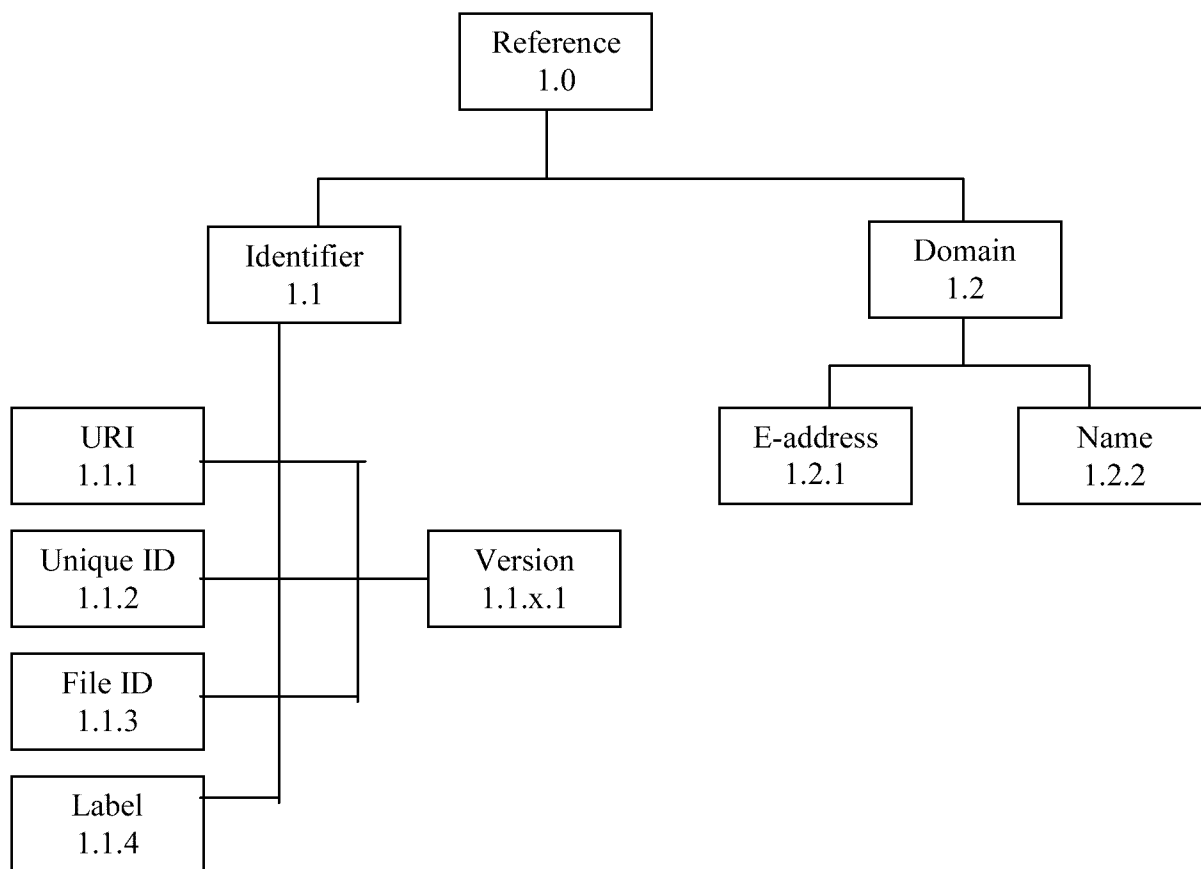
#### 5.9.4 Representation\_Format\_Details\_Digital\_Object

<b>Element name</b>	Representation_Format_Details_Digital_Object_Code
<b>Identifier</b>	5.9.4.1
<b>Version/version date</b>	0.1
<b>Registration authority</b>	Defense Technical Information Center
<b>Synonymous name</b>	
<b>Context</b>	
<b>Definition</b>	Code type and version used to execute program. NEDLIB/MD: Uses Interpreter and compiler to reference programming that allows analysis and execution of source program or translation of program. Includes Name, Version, and Instruction. NLA: Code type used to compile the executable and version.
<b>Classification scheme</b>	
<b>Keywords</b>	Code type; Program executable; Interpreter; Compiler
<b>Related data reference</b>	Representation_Format_Details_Digital_Object_Code
<b>Type of relationship</b>	child_of
<b>Category</b>	Character representation
<b>Form of representation</b>	Text
<b>Datatype</b>	Character
<b>Maximum size</b>	Unlimited
<b>Minimum size</b>	0
<b>Layout of representation</b>	
<b>Example/Code</b>	Compiled using Intel code executable for Windows 95 environment. Compiled using Perl script. Java version 1.2.
<b>Permissible values</b>	
<b>Responsible organization</b>	Defense Technical Information Center
<b>Status</b>	Final
<b>Submitting organization</b>	Defense Technical Information Center
<b>Comment</b>	
<b>MARC/DC crosswalk</b>	<DC>Format
<b>Source</b>	
<b>Applicable to all formats</b>	Only complex digital objects.
<b>Obligation</b>	Optional
<b>Maximum occurrence</b>	Repeatable

## Appendix A. Diagrams Mapping DVL Data Elements to OAIS Framework

### Reference Information

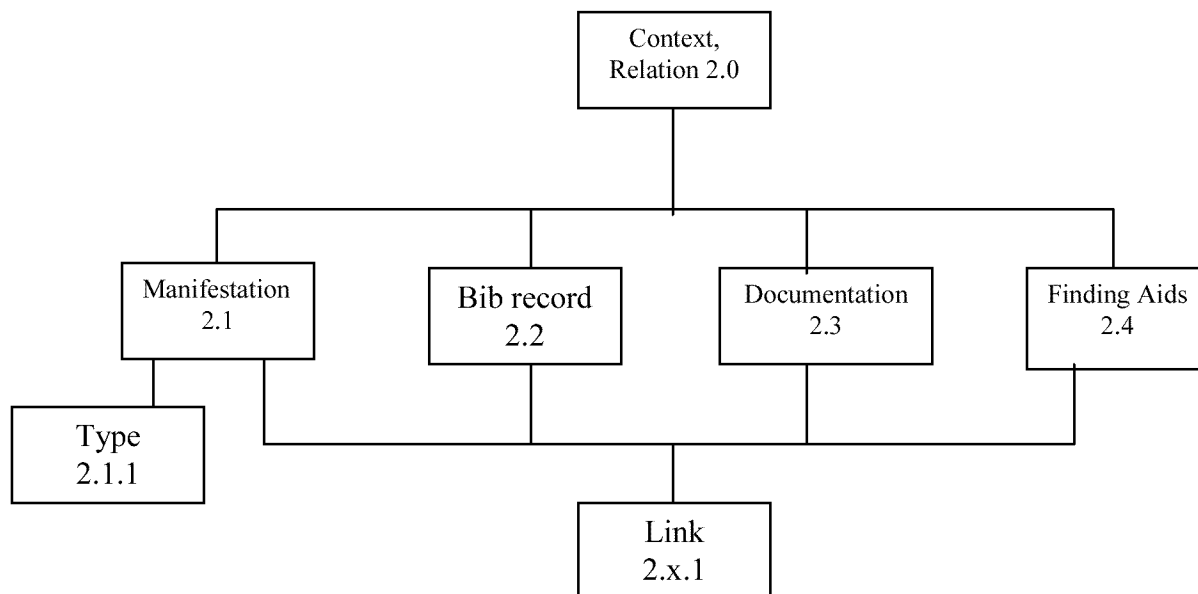
This diagram illustrates Reference subelements.





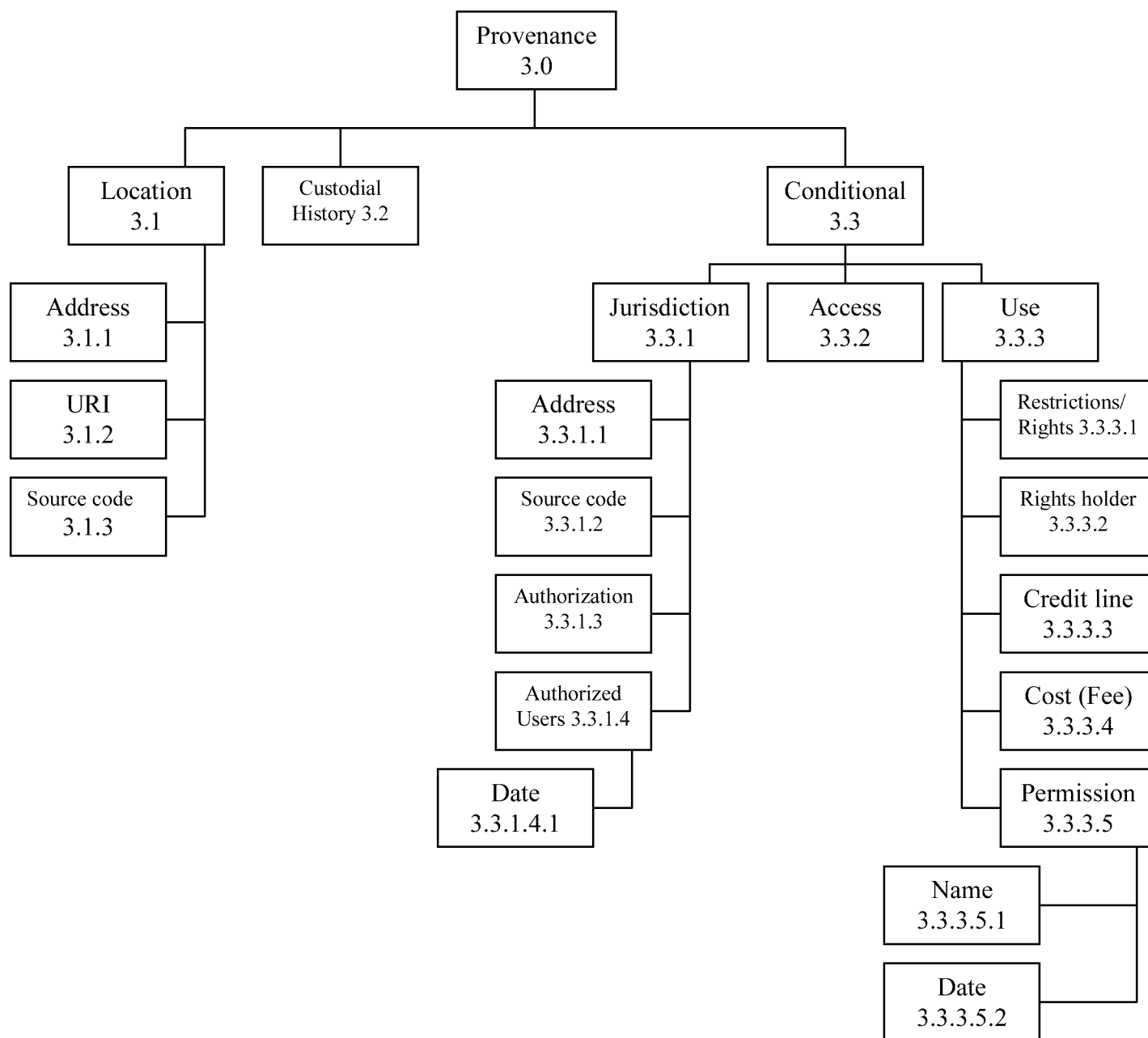
## **Context Information**

This diagram illustrates Context subelements.



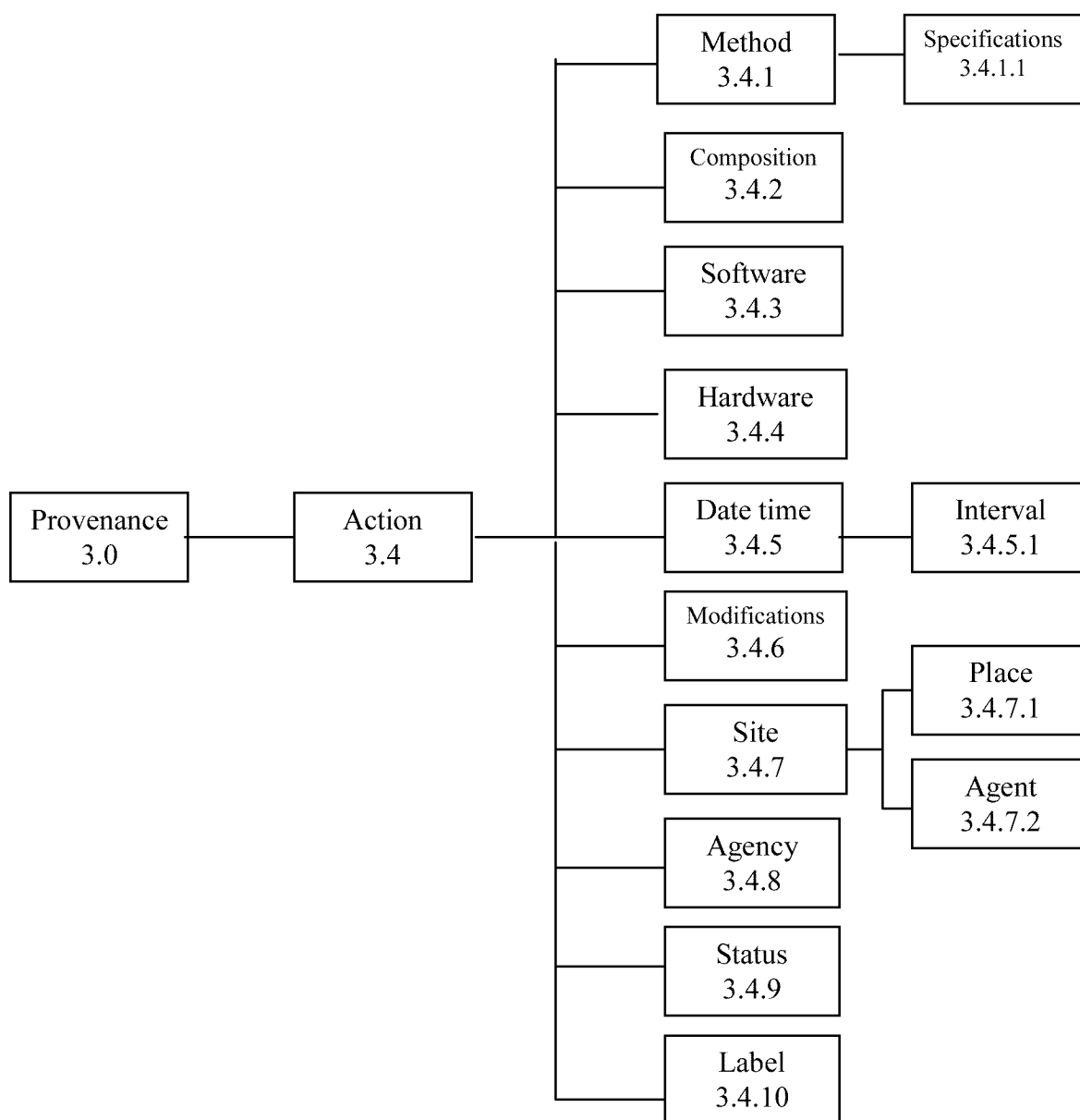
## Provenance Information

This diagram illustrates Provenance subelements: Location, Custodial history and Conditional. Action subelements are listed in the tree on the following page.



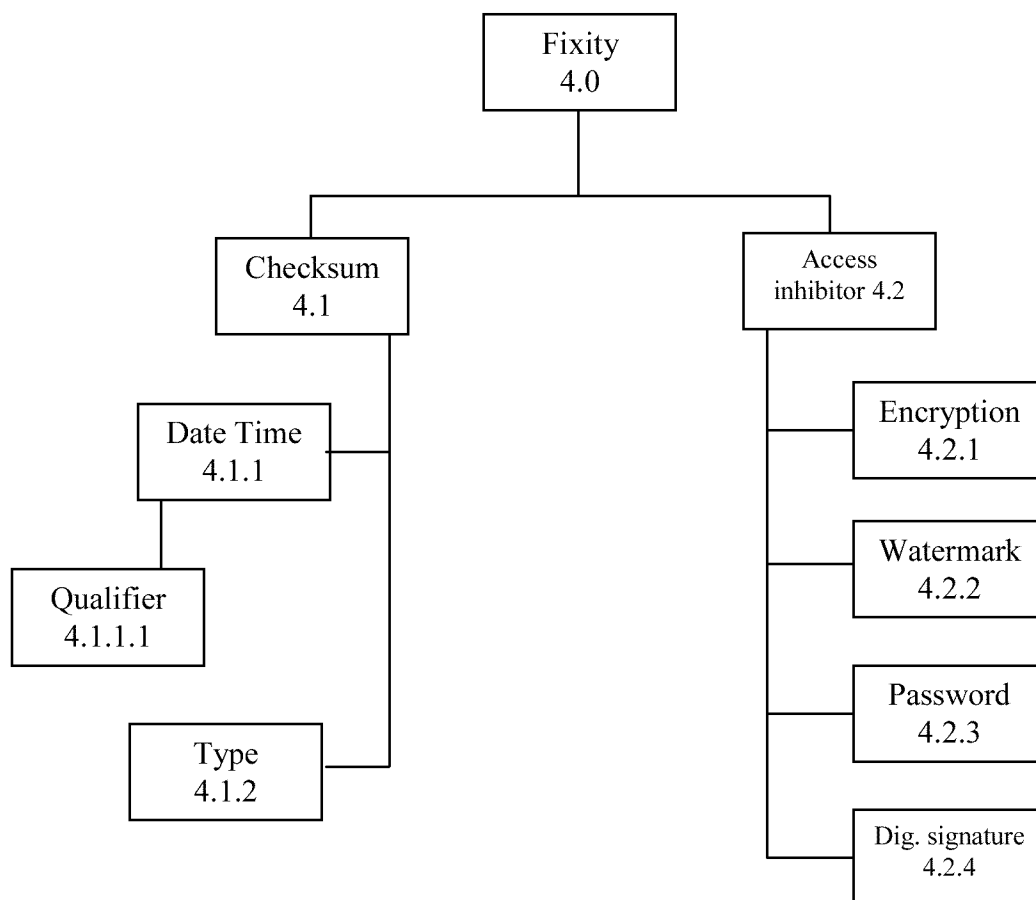
## Provenance Information (continued)

This diagram illustrates Provenance\_Action subelements.



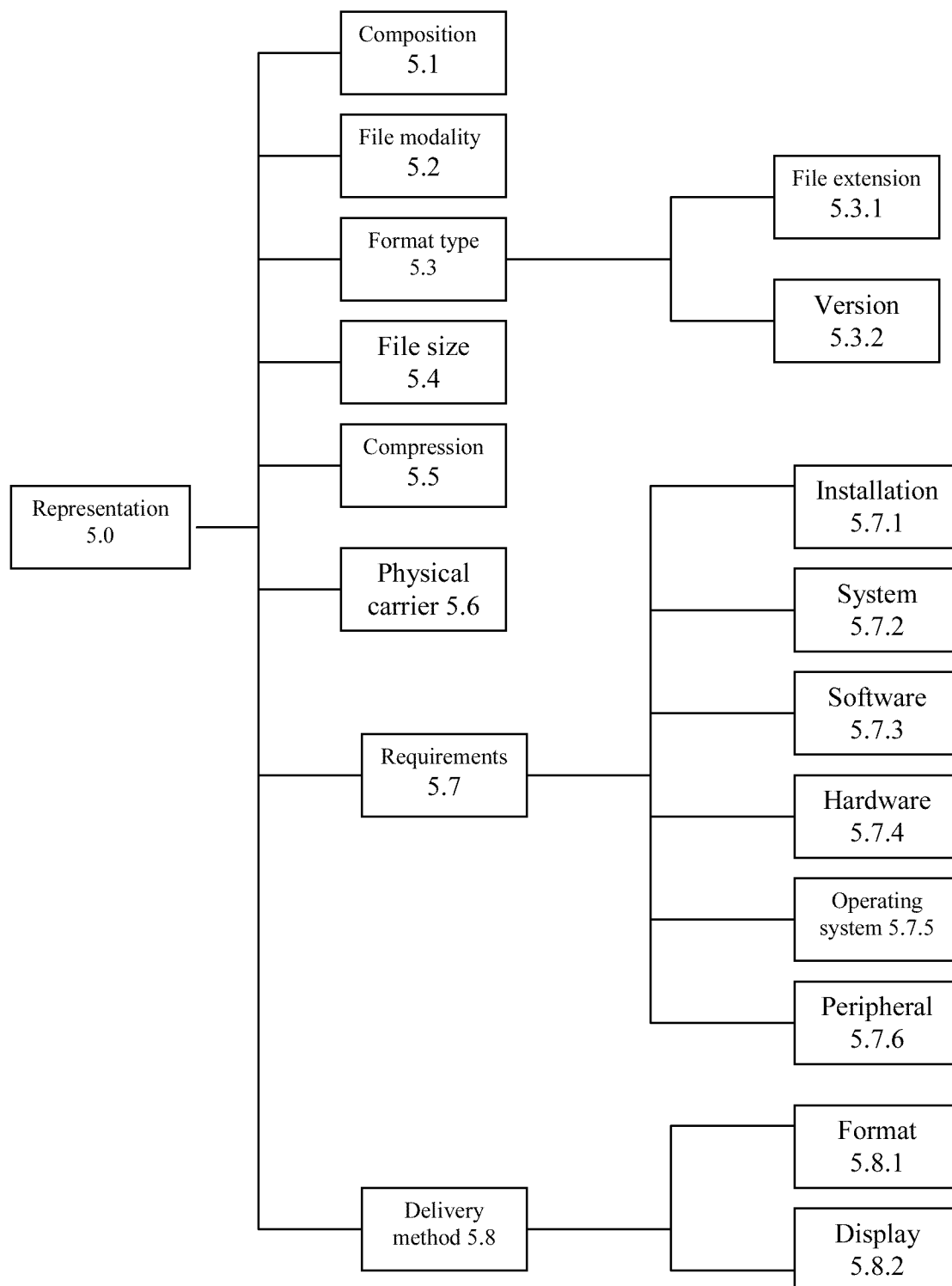
## Fixity Information

This diagram illustrates Fixity subelements.



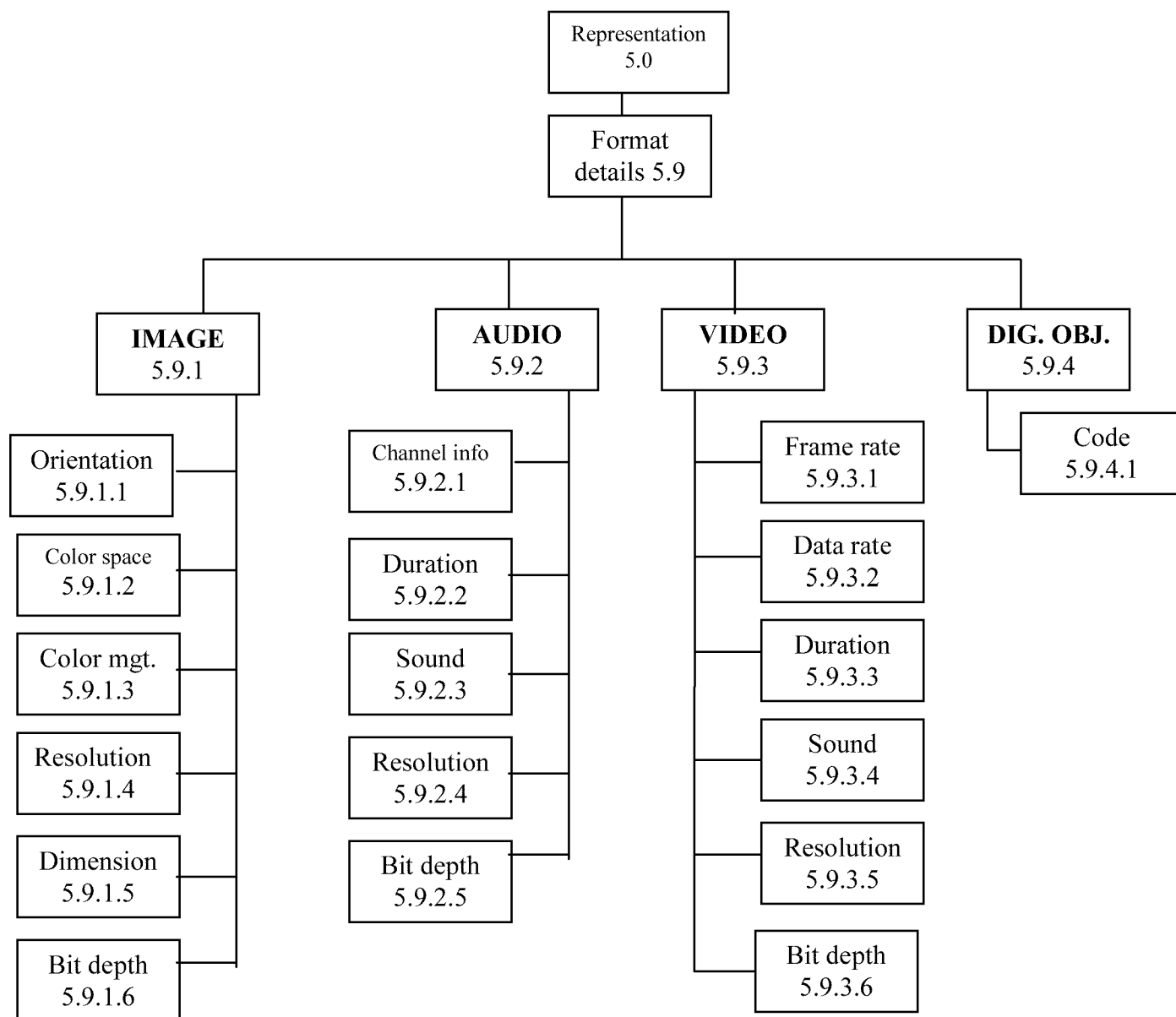
## Representation Information

This diagram illustrates general Representation subelements. Subelements grouped by format are contained in the tree on the following page.



## Representation Information (continued)

This diagram illustrates Representation\_Format\_details subelements grouped by format.



## Appendix B. Table Listing DVL Data Elements in OAIS Framework<sup>12</sup>

OAIS	Identifier	Element Name
<b>1.0 Reference Information</b> <sup>13</sup>	1.1	Reference_Identifier
	1.1.1	Reference_Identifier_Uniform_Resource
	1.1.2	Reference_Identifier_Unique
	1.1.3	Reference_Identifier_Electronic_File
	1.1.4	Reference_Identifier_Label
	1.1.x.1	Reference_Identifier_Version
	1.2	Reference_Domain
	1.2.1	Reference_Domain_Electronic_Address
	1.2.2	Reference_Domain_Name
<b>2.0 Context Information</b> <sup>14</sup>	2.1	Context_Relation_Manifestation
	2.1.1	Context_Relation_Manifestation_Type
	2.2	Context_Relation_Bibliographic_Record
	2.3	Context_Relation_Documentation
	2.4	Context_Relation_Finding_Aid
	2.x.1	Context_Relation_Link
<b>3.0 Provenance Information</b> <sup>15</sup>	3.1	Provenance_Location
	3.1.1	Provenance_Location_Address
	3.1.2	Provenance_Location_Uniform_Resource_Identifier
	3.1.3	Provenance_Location_Source_Code
	3.2	Provenance_Custodial_History
	3.3	Provenance_Conditional
	3.3.1	Provenance_Conditional_Jurisdiction
	3.3.1.1	Provenance_Conditional_Jurisdiction_Address
	3.3.1.2	Provenance_Conditional_Jurisdiction_Source_Code
	3.3.1.3	Provenance_Conditional_Jurisdiction_Authorization
	3.3.1.4	Provenance_Conditional_Jurisdiction_Authorized_Users
	3.3.1.4.1	Provenance_Conditional_Jurisdiction_Authorized_Users_Date
	3.3.2	Provenance_Conditional_Access
	3.3.3	Provenance_Conditional_Use
	3.3.3.1	Provenance_Conditional_Use_Rights/Restrictions
	3.3.3.2	Provenance_Conditional_Use_Rights_Holder
	3.3.3.3	Provenance_Conditional_Use_Credit_Line

<sup>12</sup> Based on OAIS research documented in the OCLC/RLG Preservation Metadata Working Group White paper, *Preservation Metadata for Digital Objects: A Review of the State of the Art* [[http://www.oclc.org/digitalpreservation/presmeta\\_wp.pdf](http://www.oclc.org/digitalpreservation/presmeta_wp.pdf)], January 31, 2001.

<sup>13</sup> Describes identifiers assigned to the content information, e.g. URN, ISBN.

<sup>14</sup> Documents relationship of Content Information to its environment, e.g. why created.

<sup>15</sup> Documents source of the content information, e.g. origins, actions, custody, migration.

OAIS	Identifier	Element Name
	3.3.3.4	Provenance_Conditional_Use_Cost(Fee)
	3.3.3.5	Provenance_Conditional_Use_Permission
	3.3.3.5.1	Provenance_Conditional_Use_Permission_Name
	3.3.3.5.2	Provenance_Conditional_Use_Permission_Date
	3.4	Provenance_Action
	3.4.1	Provenance_Action_Method
	3.4.1.1	Provenance_Action_Method_Specifications
	3.4.2	Provenance_Action_Composition
	3.4.3	Provenance_Action_Software
	3.4.4	Provenance_Action_Hardware
	3.4.5	Provenance_Action_Date_Time
	3.4.5.1	Provenance_Action_Date_Time_Interval
	3.4.6	Provenance_Action_Modification_History
	3.4.7	Provenance_Action_Site
	3.4.7.1	Provenance_Action_Site_Place
	3.4.7.2	Provenance_Action_Site_Agent
	3.4.8	Provenance_Action_Agency
	3.4.9	Provenance_Action_Status
	3.4.10	Provenance_Action_Label
<b>4.0 Fixity Information<sup>16</sup></b>	4.1	Fixity_Checksum
	4.1.1	Fixity_Checksum_Date_Time
	4.1.1.1	Fixity_Checksum_Date_Time_Qualifier
	4.1.2	Fixity_Checksum_Type
	4.2	Fixity_Access_Inhibitor
	4.2.1	Fixity_Access_Inhibitor_Encryption
	4.2.2	Fixity_Access_Inhibitor_Watermark
	4.2.3	Fixity_Access_Inhibitor_Password_Protection
	4.2.4	Fixity_Access_Inhibitor_Digital_Signature
<b>5.0 Representation Information<sup>17</sup></b>	5.1	Representation_Composition
	5.2	Representation_File_Modality
	5.3	Representation_Format_Type
	5.3.1	Representation_Format_Type_File_Extension
	5.3.2	Representation_Format_Type_Version
	5.4	Representation_File_Size
	5.5	Representation_Compression
	5.6	Representation_Physical_Carrier
	5.7	Representation_Requirements
	5.7.1	Representation_Requirements_Installation

<sup>16</sup> Documents authentication mechanisms, e.g. checksum.

<sup>17</sup> Information needed to make the Data Object understandable, including structure information, semantic information, representation network, representation rendering software, and access software.



OAIS	Identifier	Element Name
	5.7.2	Representation_Requirements_System
	5.7.3	Representation_Requirements_Software
	5.7.4	Representation_Requirements_Hardware
	5.7.5	Representation_Requirements_Operating_System
	5.7.6	Representation_Requirements_Peripheral
	5.8	Representation_Delivery_Method
	5.8.1	Representation_Delivery_Method_Format
	5.8.2	Representation_Delivery_Method_Display
	5.9	Representation_Format_Details
	5.9.1	Representation_Format_Details_Image
	5.9.1.1	Representation_Format_Details_Image_Orientation
	5.9.1.2	Representation_Format_Details_Image_Color_Space
	5.9.1.3	Representation_Format_Details_Image_Color_Management
	5.9.1.4	Representation_Format_Details_Image_Resolution
	5.9.1.5	Representation_Format_Details_Image_Dimension
	5.9.1.6	Representation_Format_Details_Image_Bit_Depth
	5.9.2	Representation_Format_Details_Audio
	5.9.2.1	Representation_Format_Details_Audio_Channel_Information
	5.9.2.2	Representation_Format_Details_Audio_Duration
	5.9.2.3	Representation_Format_Details_Audio_Sound
	5.9.2.4	Representation_Format_Details_Audio_Resolution
	5.9.2.5	Representation_Format_Details_Audio_Bit_Depth
	5.9.3	Representation_Format_Details_Video
	5.9.3.1	Representation_Format_Details_Video_Frame_Rate
	5.9.3.2	Representation_Format_Details_Video_Data_Rate
	5.9.3.3	Representation_Format_Details_Video_Duration
	5.9.3.4	Representation_Format_Details_Video_Sound
	5.9.3.5	Representation_Format_Details_Video_Resolution
	5.9.3.6	Representation_Format_Details_Video_Bit_Depth
	5.9.4	Representation_Format_Details_Digital_Object
	5.9.4.1	Representation_Format_Details_Digital_Object_Code

## **Appendix C. Definitions of OAIS Terminology**

**Archival record** equates to Content Information in an Archival Information Package.

**Archive Information Package:** aggregation of the four types of Information Object.

**Content Information:** data object of primary interest; data object and representation information. Content Information is information the archive is mandated to preserve.

**Descriptive Information:** facilitates access through search and retrieval; package descriptions to support order of information.

**Information object:** Data Object combined with Representation Information. 4 classes of information objects are: Content Information, Preservation Description Information, Packaging Information and Descriptive Information.

**Information Package:** aggregation of Content Information Object, Preservation Description Information Object, Packaging Information Object and Descriptive Information Object. It is a container for Content Information and Preservation Description Information, encapsulated by the Packaging Information, and discoverable with Descriptive Information.

**OAIS:** Open Archival Information System. Reference model establishes a conceptual framework for a digital archive.

**Packaging Information:** binds object and metadata into identifiable unit

**Preservation Description Information:** 4 types: Provenance, Reference, Fixity and Context Information (see Appendix B); information necessary to preserve Content Information.

**Representation Information:** Structure information (data structure concepts like bits and pixels) and semantic information (complex meanings associated with structure information elements).

## **Appendix D. Sources Consulted Including References and Acronyms**

**All links verified 2-21-2002.**

ADN: ADN (ADEPT/DLESE/NASA) Joint Metadata Framework. Metadata Working Group. <http://www.dlese.org/Metadata/index.htm>

AVPP: Audio-Visual Prototyping Project Working Documents. Extension Schemas for the Metadata Encoding and Transmission Standard (METS)  
<http://lcweb.loc.gov/rr/mopic/avprot/metsmenu.html>

CDL: California Digital Library. Digital Image Collection Standards (Sept. 1999) and Digital Object Standard: Metadata, Content and Encoding (May 2001).  
<http://www.cdlib.org/about/publications/>

CDL Best Practices: "Best Practices for Image Capture," Version 1.0, February 2001, maintained by the CDL Technical Architecture and Standards Workgroup.  
<http://www.cdlib.org/about/publications/>

CDL Digital Image Format Standards. July 9, 2001.  
<http://www.cdlib.org/about/publications/>

CDP: Colorado Digitization Project. Metadata Matrix.  
<http://coloradodigital.coalliance.org/matrix.html>

CF: Carl Fleishhauer's AV Metadata Table.  
<http://lcweb.loc.gov/rr/mopic/avprot/avmeta.html>

CEDARS: Cedars Preservation Metadata Elements.  
<http://users.ox.ac.uk/~cedars/Papers/AIW02.html> [no longer available] and Rethinking Preservation Description Information (PDI) for the Cedars Project.  
<http://www.ukoln.ac.uk/metadata/cedars/papers/AIW03/>

DIG35: Digital Imaging Group (DIG). DIG35 Specification: Metadata for Digital Images. Version 1.0. August 30, 2000. [http://www.digitalimaging.org/i\\_dig35.html](http://www.digitalimaging.org/i_dig35.html)

DTIC/MG: Defense Technical Information Center. Metadata Guidelines.  
<http://dvl.dtic.mil/notes.html>

EUL: Digital Preservation at EUL (Edinburgh University Library)/Edinburgh Metadata Schema. <http://www.lib.ed.ac.uk/lib/sites/digpres/metadataschema.shtml>

EAD: Encoded Archival Description. <http://www.loc.gov/ead/ead.html>

GEM: Gateway to Educational Materials. GEM Element List.  
[http://www.geminfo.org/Workbench/Metadata/GEM\\_Element\\_List.html](http://www.geminfo.org/Workbench/Metadata/GEM_Element_List.html)

HAR: Harvard University Library. Library Digital Initiative. Administrative Metadata for Digital Audio Files. <http://sylvia.harvard.edu/~robin/drsautionew.doc>

IMS: Instructional Management Systems (IMS) Global Learning Consortium. IMS Learning Resource Meta-Data Information Model; IMS Learning Resource Meta-Data Best Practice and Implementation Guide; and IMS Learning Resource Meta-Data XML Binding, version 1.2.1 final specification, 28 September 2001. <http://imsglobal.org/metadata/index.html>

IU/RKMS: Comparison of Indiana University Recordkeeping Metadata Specifications (IU RMS) to the Recordkeeping Metadata Standard of the National Archives of Australia (RKMS), September 2001. <http://www.indiana.edu/~libarch/ER/NHPRC-2/iu-aus-metadata.pdf>

LC/CORE: Table of Core Metadata Elements for Library of Congress Digital Repository Development. <http://lcweb.loc.gov/standards/metatable.html>

LC/CNRI: Metadata Table for the Coolidge-Consumerism Experiment. <http://lcweb2.loc.gov/ammem/award/docs/nisometa/metawww1.html#IV.C>

LOM: Draft Standard for Learning Object Metadata. Institute of Electrical & Electronics Engineers (IEEE) Learning Technology Standards Committee Working Group, version 6.1, 18 April 2001. [http://ltsc.ieee.org/doc/wg12/LOM\\_WD6-1\\_1\\_without\\_tracking.pdf](http://ltsc.ieee.org/doc/wg12/LOM_WD6-1_1_without_tracking.pdf)

LTP: Long Term Preservation – Research Study by IBM and Koninklijke Bibliotheek (National Library of the Netherlands) <http://www.kb.nl/kb/ict/dea/ltp/ltpstudy-overview.pdf>

MARC21: MARC21: Format for Bibliographic Data, 1999 edition (hard copy).

METS: Metadata Encoding & Transmission Standard. <http://www.loc.gov/standards/mets/>

MOA2: The Making of America II Testbed Project. <http://www.clir.org/pubs/reports/pub87/contents.html>

OAIS: Reference Model for an Open Archival Information System. <http://www.ccsds.org/documents/pdf/CCSDS-650.0-R-2.pdf>

NDLP: National Digital Library Project. Structural Metadata Dictionary for LC Digital Objects. <http://lcweb.loc.gov:8081/ndlint/repository/attdefs.html>

NAA: National Archives of Australia. Recordkeeping Metadata Standard for Commonwealth Agencies. <http://www.aa.gov.au/recordkeeping/control/rkms/summary.htm>

NLA: National Library of Australia. Preservation Metadata for Digital Collections.  
<http://www.nla.gov.au/preserve/pmeta.html>

NEDLIB: Networked European Deposit Library. NEDLIB Glossary (available in PDF)  
<http://www.konbib.nl/nedlib/>

NEDLIB/MD: Metadata for the Long Term Preservation of Electronic Publications.  
NEDLIB Report Series 2. <http://www.konbib.nl/nedlib/>

NISO: NISO Draft Standard. Data Dictionary: Technical Metadata for Digital Still  
Images. <http://www.niso.org/pdfs/DataDict.pdf>

PITT: Metadata Specifications Derived from the Functional Requirements: A Reference  
Model for Business Acceptable Communications.  
<http://www.sis.pitt.edu/~nhprc/meta96.html> [no longer available]

PMWG: Preservation Metadata Working Group. A Recommendation for Content  
Information. <http://www.oclc.org/research/pmwg/>

RLG: Research Libraries Group Working Group on Preservation Issues of Metadata.  
<http://www.rlg.org/preserv/presmeta.html>

ViDe: Video Development Initiative. ViDe User's Guide: Dublin Core Application  
Profile for Digital Video.  
[http://www.vide.net/conferences/vide\\_dc\\_app.pdf](http://www.vide.net/conferences/vide_dc_app.pdf)

VRA: Visual Resources Association (VRA) Data Standards Committee. VRA Core  
Categories, version 3.0.  
<http://www.gsd.harvard.edu/~staffaw3/vra/vracore3.htm>